HONG KONG MONETARY AUTHORITY
香港金融管理局

HALF-YEARLY MONETARY AND FINANCIAL STABILITY REPORT

March 2023

This Report reviews statistical information between the end of August 2022 and the end of February 2023.

Half-Yearly Monetary and Financial Stability Report
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1. Summary and overview

The global growth prospect is expected to weaken going into 2023. The stubbornly high inflation rate, the likelihood of a significant growth slowdown in the US and the Euro area amid the cumulated monetary tightening since 2022, and the recent emergence of banking stress in the US and Europe are increasing the uncertainty of economic outcomes and hence financial market volatility.

Hong Kong's exchange rate and interbank market continued to trade in a smooth and orderly manner. Following US policy rate hikes, many banks raised their Best Lending Rates. With total deposits increasing modestly in the seven months since end-June 2022, there was no notable sign of outflows from the Hong Kong banking system. Partly reflecting subdued credit demand, bank credit declined modestly during the same period. The residential property market was under pressure in the second half of 2022, before showing some signs of stabilising in early 2023.

Looking ahead, while the relaxation of COVID-19 restrictions should brighten the outlook for the Hong Kong economy, uncertainties related to future US interest rate adjustments, the growth outlook of major advanced economies, and the lingering geopolitical risks, will pose challenges to the banking sector. Banks should stay vigilant against the impacts of these risk factors on the asset quality of their loan portfolios.

The external environment

During the review period, global inflationary pressures eased but major central banks continued to tighten monetary policy as labour markets remained tight. However, the high interest rate environment coupled with the recent emergence of banking stress in the US and Europe with a failure of a few domestic US banks in March, are increasing uncertainties surrounding the economic outlook and financial markets. As upside risks to inflation cannot be ruled out, there is a possibility that major central banks may have to keep rates higher for longer than market expectations, potentially leading to disruptive repricing of asset valuation ahead.

The materialisation of climate risk could also trigger abrupt repricing of related assets. With the promise of financing projects that bring positive environmental benefits, corporate green bond markets have been developed to mitigate climate risk. Box 1 studies whether the issuers have delivered on their promises and the policy implications for fostering a healthier development of corporate green bond markets.

In emerging Asia, economic growth moderated further in the second half of 2022 as exports' growth fell notably along with the global economic slowdown. Inflationary pressures in some regional economies were at high levels due to the global supply disruptions to food and fuel commodities. As regional central banks accelerated monetary tightening to combat inflation, the region's financial vulnerabilities have been increasingly exposed, particularly, the rising downward pressure on housing valuation along with the rate hikes. Given that housing loans account for a significant share of bank loans, further housing market corrections could have repercussions for their banking systems. The rising borrowing costs will also pose liquidity challenges to indebted firms. Some of these firms are also carrying significant foreign currency debt and hence are susceptible to foreign exchange risk. Box 2 examines whether these corporates have hedged well against the risk, and how the development of foreign exchange derivatives markets in financial centres, such as Hong Kong, has been fostering the use of derivative hedge by corporates in the region.

In Mainland China, after rebounding in the third quarter of 2022, economic growth moderated in the fourth quarter amid COVID-19 outbreaks and weak property market conditions. Looking ahead, Mainland economic growth is likely to accelerate in 2023 on the back of the recovery in private consumption following the easing of COVID-19 restrictions. That said, uncertainties surrounding the near-term growth outlook remain high, depending on how the COVID-19 situation evolves and when the property market stabilises (Box 3 discusses the impacts of the real estate sector on other segments of the economy). To support the economy, the government called for shoring up business confidence by pushing forward structural reforms, such as treating state-owned enterprises (SOEs) and private-owned enterprises (POEs) equally, and boosting domestic demand, especially consumption, through more forceful supportive measures.

The domestic economy

Hong Kong's economy contracted visibly further by over 4% year on year in the second half of 2022. The economic contraction mainly reflected sizeable declines in merchandise exports and aggregate investment along with a weaker global economy and tightened financial conditions. Private consumption was supportive to growth, and exports of services improved slightly following the relaxation of the compulsory quarantine requirements for overseas visitors since late September 2022. For 2022 as a whole, real gross domestic product (GDP) fell by 3.5%, contrasting with the 6.4% growth in 2021.

Riding on the reopening of Mainland China and Hong Kong, economic growth for 2023 is expected to recover from a low base. While the anticipated weaker growth of the advanced economies will continue to weigh on Hong Kong's exports of goods, a recovery in the Mainland's economy and the lifting of restrictions on cross-boundary land transportation with Mainland China could provide some support. The reopening of Mainland China and Hong Kong should also greatly benefit Hong Kong's inbound tourism and other exports of services, as well as local business sentiment and capital spending. Box 4 discusses the recent revival of visitor arrivals into Hong Kong, and provides evidence that the delayed reopening of Hong Kong relative to other regional economies is expected to have only a limited and transitory impact on inbound tourism, with negligible scarring effect. Private consumption will also improve further along with a stronger labour market. The Government forecasts real GDP growth for the whole of 2023 in the range of 3.5% to 5.5%, and the growth estimates by private-sector analysts average 3.7%. However, the growth outlook is fraught with risks and uncertainties, especially those relating to the US Federal Reserve (Fed)'s policy rate path, global growth prospects, lingering geopolitical tensions and the recovery pace of Hong Kong's inbound tourism (see also discussion above).

Local labour market conditions continued to improve in recent months, with the unemployment rate declining to 3.3% in February 2023. Total employment also rebounded from a recent low in May 2022, albeit still below its pre-pandemic level. Looking ahead, the labour market is likely to improve further as local economic activities return to normal.

On the price front, the underlying inflation rate remained moderate at 1.8% in both the third and fourth quarters of 2022, and 2.1% in January and February 2023 combined.[1] In the near term, local inflation is expected to edge up, but should stay mild reflecting offsetting forces. While external prices should remain elevated, their upward momentum will likely moderate further alongside weaker economic activities in some major economies and easing upward pressures on commodity prices. Domestic cost pressures may edge up alongside the recovery in the economy and the labour market, but the soft housing rentals should provide some offset. The Government projection of underlying and headline inflation rates for 2023 is at 2.5% and 2.9% respectively, and the latest market consensus forecasts the headline inflation rate for 2023 to be 2.4%.

Monetary conditions and capital flows

The Hong Kong dollar stayed close to the weak-side Convertibility Undertaking (CU) from September to early November 2022, driven by the correction of the local stock market, market expectation of further US interest rate hikes, and continued carry trade activities. It regained some strength from mid-November to the end of 2022, amid stronger local equity market activities and year-end funding demand. Moving into 2023, the Hong Kong dollar exchange rate softened to close to the weak-side CU again as the seasonal demand faded. From the first weak-side CU triggering in May 2022 to February 2023, the weak-side CU was triggered 43 times in total, and the HKMA purchased a total of HK$261.2 billion at the request of banks in accordance with the design of the Linked Exchange Rate System (LERS).

Overall, Hong Kong's interbank market continued to trade in a smooth and orderly manner. The Hong Kong Interbank Offered Rate (HIBOR) gradually increased from September to December 2022 alongside US rate hikes, and receded in the beginning of 2023 as the seasonal demand for Hong Kong dollar funding faded. On the retail front, following US policy rate hikes, many banks raised their Best Lending Rates three times or by 62.5 basis points in total from September to December 2022. Some major banks further increased the cap on HIBOR-based mortgage rates of newly approved mortgage loans in late November and December 2022. Accordingly, the average lending rate for new mortgages increased from 2.31% in July 2022 to 3.50% in January 2023.

Hong Kong's offshore renminbi (CNH) liquidity pool expanded during the review period, with the total outstanding amount of renminbi customer deposits and certificates of deposit increasing to RMB985.6 billion at the end of January 2023. Both the outstanding amount of renminbi loans and renminbi trade settlement continued to grow steadily. The average daily turnover of the renminbi Real Time Gross Settlement system stayed high at RMB1,654.0 billion in 2022.

Looking ahead, the continuing development of Hong Kong's offshore renminbi ecosystem will further reinforce its leading role in offshore renminbi business. The enhanced Currency

[1] Inclusive of the effects of the Government's relevant one-off relief measures, the year-on-year headline inflation rate was 2.7% and 1.8% in the third and fourth quarters of 2022, and 2.1% in January and February 2023 combined.

Swap Agreement with the People's Bank of China (PBoC), as well as the enhancements to the HKMA's renminbi liquidity facility, will further support and deepen Hong Kong's renminbi liquidity pool. At the same time, the continuous efforts in strengthening connectivity with the Mainland through various schemes, including the Swap Connect, the two-way Stock, Bond, and Cross-boundary Wealth Management Connects will provide a more diverse range of renminbi-denominated products in Hong Kong. In relation to financial infrastructure, the planned upgrading of the Central Moneymarkets Unit (CMU) into a major international central securities depository (ICSD) in Asia will also add to a robust and secure channel for overseas investors to efficiently trade renminbi assets. With these initiatives, Hong Kong will be in a position to capture further opportunities brought by the continuing liberalisation of Mainland's capital account and the deepening regional economic and financial co-operation under the Belt and Road and the Guangdong-Hong Kong-Macao Greater Bay Area initiatives.

Asset market

Amid monetary tightening by major central banks, global equity prices underwent a sharp correction in September and October 2022. The weak market sentiment pushed the Hang Seng Index to a thirteen and a half-year low of 14,687 points on 31 October. The local equity market rebounded afterwards, led by the prospects of a slowdown in US interest rate hikes and re-opening of the Mainland and Hong Kong economies, before declining in February 2023. Overall, the Hang Sang Index declined slightly by 0.8% from the end of August 2022 to the end of February 2023.

Along with the monetary tightening in the US, yields of US 10-year Treasury and Hong Kong dollar 10-year Government Bond surged and reached the peak in late October 2022. The yields eased afterwards, before going up in February 2023. Despite the rising interest rates, the Hong Kong debt market continued to grow in 2022.

The near-term outlook of the local equity market would be clouded by risks of higher for longer interest rates and significant growth slowdown in advanced economies, as well as escalating geopolitical tensions such as the Russia-Ukraine conflict, while the rapid re-opening of the Mainland economy may help boost the prospects of the Hong Kong equity market. For the local debt market, policy supports to the Mainland economy could help lift the demand for CNH debt securities.

During the review period, the local debt market continued to attract Mainland entities to issue offshore renminbi bonds. This, together with the successful offering by the Hong Kong Government of green bonds worth US$5.75 billion and the inaugural tokenised green bond of HK$800 million, strengthened Hong Kong's status as a global offshore renminbi centre, and a premier green and sustainable finance hub in Asia.

Amid tightened financial conditions and weak economic activities, the residential property market was under pressure in the second half of 2022, with moderating trading activities, more selling price cuts and a softening in transacted prices. For 2022 as a whole, the total transaction volume dropped to a record-low of 45,050 units, down 39% from 2021, while housing prices recorded an orderly adjustment of 15%. In early 2023, the housing market showed signs of stabilisation as market sentiment revived alongside the resumption of travel between Mainland China and Hong Kong.

Following the US Fed's successive policy rate hikes, major banks have raised their effective mortgage interest rates, putting an additional burden on borrowers' mortgage repayments. The estimated number of residential mortgage loans (RMLs) in negative equity increased to 12,164 cases at end-December 2022 as housing prices softened. These cases were related to bank staff housing loans or RMLs under the Mortgage Insurance Programme (MIP), which generally have a higher loan-to-value (LTV) ratio. It should be noted that the MIP has strict requirements on the applicant's repayment ability. In fact, the delinquency ratio of RMLs under the MIP was 0.01% at end-December 2022, which is even lower than the 0.06% delinquency ratio of RMLs for the whole banking sector, suggesting that the loan quality under the MIP is very high. Looking ahead, the continued recovery of the labour market is expected to help households meet their mortgage obligation and thus contain any upward pressures on the delinquency ratio of the RML. As such, the risks relating to banks' RMLs are considered to be manageable.

More broadly, the macro-prudential measures introduced by the HKMA since 2009 have helped contain household leverage and strengthen banks' risk management for mortgage loans, thereby improving their resilience to interest rate and property market shocks. However, the public should be prepared for the likelihood that banks' lending rates may increase further, and should carefully assess and manage the relevant risks when making property purchases and mortgage decisions.

The residential property market outlook is subject to a number of uncertainties and risks as discussed previously. In particular, higher mortgage interest rates and greater short-term private housing supply may continue to cloud the housing market outlook, while the normalisation of cross-boundary travel between Mainland China and Hong Kong may release pent-up demand and revitalise market sentiment. Over the longer term, the outlook for the housing market will depend on the supply-demand gap. The Government projects that private housing supply will remain high in the coming years.

The non-residential property market turned more sluggish in the second half of 2022. Along with reduced transactions, the prices of commercial and industrial properties retreated, while rentals generally stayed soft. The outlook for the non-residential property market will hinge on a number of offsetting factors. For instance, the reopening of Mainland China and Hong Kong is expected to drive the recovery of inbound tourism and therefore provide some support to the retail segment. On the other hand, the prevailing high vacancy rate, coupled with additional new supply in the near term, may continue to weigh on the rental and capital values of commercial properties.

Banking sector performance

Against the rising interest rate environment, retail banks' profit improved notably in the second half of 2022 as increases in net-interest income and income from foreign exchange and derivatives more than offset an increase in bad debt provisions and a decline in income from fees and commissions. The aggregate pre-tax operating profit of retail banks rose by 74.0% in the second half of 2022 compared with the same period in 2021. Accordingly, the return on assets rose to 0.80% in the second half of 2022 compared with 0.48% in the same period last year.

Partly reflecting the subdued credit demand amid higher borrowing costs and soft economic activities, total loans and advances of all authorized institutions (AIs) declined modestly by 3.8% in the second half of 2022. The decline was driven by a contraction of both domestic credit (comprising loans for use in Hong Kong and trade financing) and loans for use outside

Hong Kong during the review period. Meanwhile, classified loan ratios of all AIs increased in the second half of 2022, but remained at a healthy level.

Overall, the Hong Kong banking sector remained resilient, underpinned by sound and robust capital and liquidity positions. The consolidated total capital ratio of locally incorporated AIs stood high at 20.1% at the end of 2022, well above the minimum international standards. The average Liquidity Coverage Ratio of category 1 institutions and the average Liquidity Maintenance Ratio of category 2 institutions were 162.3% and 63.2% respectively in the fourth quarter of 2022, well above their statutory minimum requirements. The latest Net Stable Funding Ratio of banks also stayed at levels well exceeding their statutory minimum requirements.

Looking ahead, while the relaxation of COVID-19 restrictions should brighten the outlook for the Hong Kong economy, uncertainties related to future US interest rate adjustments, the growth outlook of major advanced economies, and the lingering geopolitical risks, will pose challenges to the banking sector. Banks should stay vigilant against the impacts of these risk factors on the asset quality of their loan portfolios.

The Half-yearly Report on Monetary and Financial Stability is prepared by the staff of the Research Department of the Hong Kong Monetary Authority.

2. Global setting and outlook

Global headline inflation rates retreated from their decades-high levels during the review period thanks to easing commodity prices and normalising supply chains, but core inflation remained firm amid tight labour markets. While the recent emergence of banking stress in the US and Europe has accentuated the trade-off between price stability and financial stability, upside risks to inflation cannot be ruled out, and major central banks may have to keep rates higher for longer than market expectation, which might sow the seeds of disruptive asset repricing going forward.

In emerging Asia, economic growth moderated in late 2022 as export growth slowed along with the global slowdown, while inflationary pressures remained elevated. As global and domestic financial conditions tightened, the region's financial vulnerabilities have been increasingly exposed, with rising downward pressures on housing prices and an increasing debt service burden on indebted sectors. Further intensification of these vulnerabilities may have repercussions for the regional banking sector.

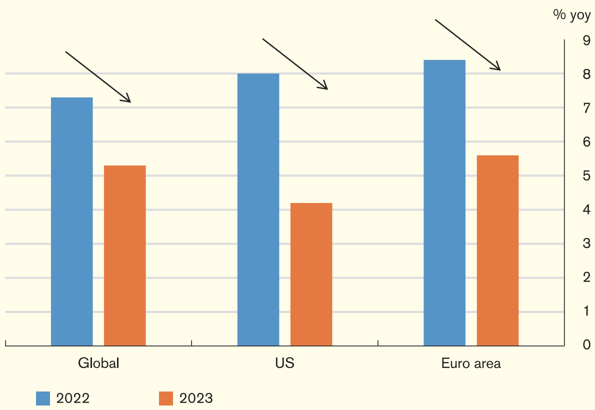
In Mainland China, economic growth slowed in the fourth quarter amid COVID-19 outbreaks and weak property market conditions, after rebounding in the third quarter. Looking forward, while uncertainties surrounding the growth outlook remain high, private consumption and other domestic economic activities are likely to revive following the easing of COVID-19 restrictions and the government's prioritisation of economic stabilisation in 2023.

2.1 External environment

During the review period, headline inflation rates in major advanced economies (AEs) eased from their decades-high levels amid softer commodity prices and normalising global supply chains that alleviated goods inflation. However, services inflation remained elevated as still-tight labour market conditions continued to drive wage growth, suggesting that monetary conditions in major AEs, while having already been tightened significantly since early 2022, were not yet likely to be restrictive enough to curb excess labour demand. Therefore, to ensure well-anchored inflation expectations, major central banks continued to tighten monetary policy despite the private sector expecting a substantial easing of inflationary pressure in 2023 (Chart 2.1) and increasingly evident signs of slowing growth momentum.

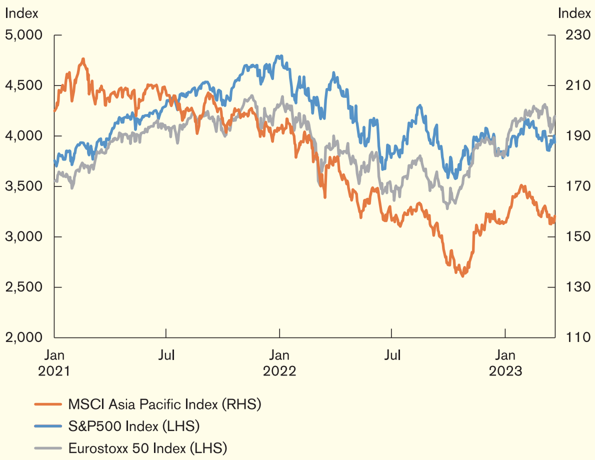
However, the high interest rate environment coupled with the recent emergence of banking stress in the US and Europe with a few domestic US banks failing in March, are increasing uncertainties surrounding the economic outlook and financial markets. Despite the regulators' swift actions in protecting depositors and providing funding support to banks, equity markets tumbled on heightened risk aversion, extending the losses since early 2023 due to the stronger-than-expected inflation readings (Chart 2.2).

Chart 2.1
Actual and projected consumer price index (CPI) inflation in selected economies



Source: Consensus Forecasts, March 2023.

Chart 2.2
Selected major equity market indices

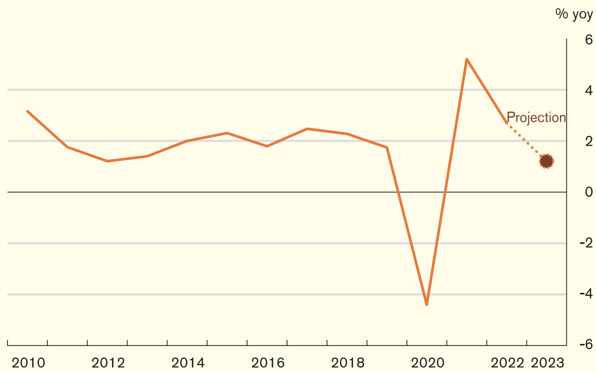


Source: Bloomberg.

Looking ahead, the global monetary policy outlook has become more uncertain as major central banks are confronted with a stark trade-off between price stability and financial stability, which could point to future asset market volatility given several lingering downside risks.

On one hand, there are rising concerns that major AEs such as the US and Europe may experience a sharp economic slowdown in 2023. Reflecting the lagged effect of the cumulative monetary tightening thus far, the International Monetary Fund (IMF) projected in January 2023 that AEs' real gross domestic product (GDP) growth would decelerate from 2.7% in 2022 to 1.2% this year, which would mark the slowest pace of expansion during the past decade (save 2020 when the COVID-19 pandemic emerged) (Chart 2.3). Moreover, pressing ahead with further rate hikes to combat inflation could potentially risk exposing hidden financial vulnerabilities that were accumulated during the low-interest-rate period. All these could weigh on the global economic outlook and entail negative spillover effects on the rest of the world, particularly emerging market economies (EMEs).

Chart 2.3
AE real GDP growth

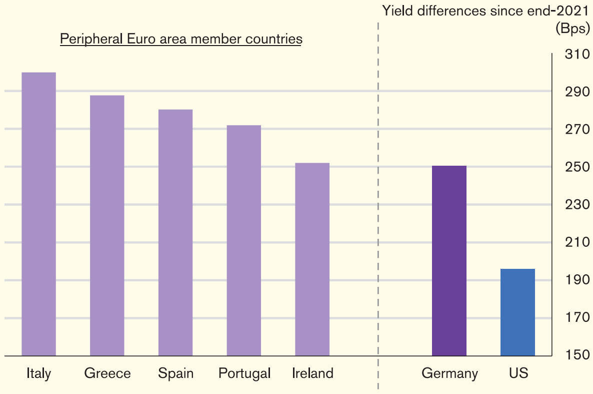


Source: IMF.

On the other hand, it is possible that the pace of disinflation may be slower than expected. For instance, uncertainties surrounding the Russia-Ukraine conflict may trigger renewed increases in global energy and food prices. Meanwhile, the more-resilient-than-expected US labour market thus far and the widespread practice of wage indexation to past inflation across Europe may pose upside risks to labour costs and hence services inflation. In this case, major central banks may have to keep rates higher for longer than market expectations, which, coupled with weaker growth and earnings outlook as major AEs are expected to experience a marked growth slowdown, might trigger disorderly repricing of risky assets to the detriment of global financial stability. The materialisation of climate risk could also trigger abrupt repricing of related assets. With the promise of financing projects that bring positive environmental benefits, corporate green bond markets have been developed to mitigate climate risk. Box 1 studies whether the issuers have delivered on their promises and the policy implications for fostering a healthier development of corporate green bond markets.

The uncertainty of the global financial conditions would also pose challenges to the debt sustainability of highly-indebted countries, including several peripheral Euro area countries such as Italy and Greece. Indeed, since early 2022 their sovereign yields have increased by a wider extent compared with other AEs in the current rate hike cycle (Chart 2.4), reflecting high credit risk premia required by investors. Should the ECB and the Fed keep their interest rates "higher-for-longer" under the slower-than-expected disinflation scenario, the sovereign spreads of those peripheral member countries could face additional upward pressure as a prolonged period of elevated borrowing costs could place their debt servicing ability under strain. From a broader global perspective, elevated borrowing costs could hurt the repayment ability of public and private debtors alike, while the weak global growth may also risk reversing the recent downtrend in global debt-to-GDP ratios.

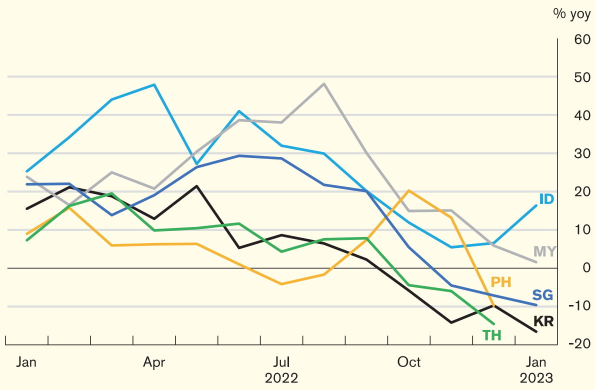
Chart 2.4
Changes in 10-year sovereign yields in selected AEs



Note: Data as of 22 March 2023.
Sources: Bloomberg and CEIC.

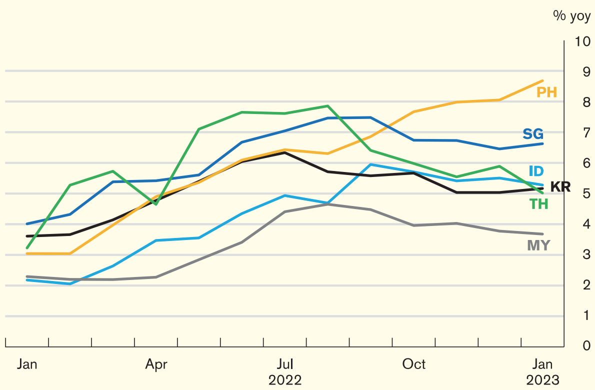
In emerging Asia, economic growth moderated further in the second half of 2022 as export growth fell notably along with the global economic slowdown, and regional exporters of technology products (South Korea and Singapore) were especially hard hit amid the downturn in the tech cycle (Chart 2.5). Meanwhile, inflationary pressures in some regional economies were at high levels due to the global supply disruptions of food and fuel commodities, with the CPI inflation rates hitting multi-year highs in the second half of 2022 before some moderation in late 2022 (Chart 2.6). Although many central banks in the region accelerated their monetary tightening to combat inflation, the rate hike path in the region was outpaced by the aggressive rate hikes taken by the Fed, with the narrowing interest rate differentials vis-à-vis that of the US leading to intense bond fund outflows from the region and currency depreciation until November 2022 when the market started to expect the US Fed to take a "dovish pivot".

Chart 2.5
Export growth



Source: CEIC.

Chart 2.6
Headline CPI inflation



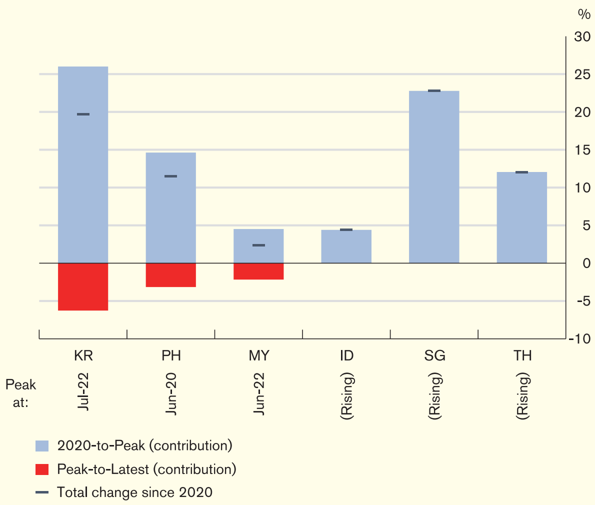
Source: CEIC.

As financial conditions tightened, the region's financial vulnerabilities that were accumulated over the past few years have been increasingly exposed. This is partly manifested in the softening of the region's housing markets amid higher interest rates. While the total change in housing prices since 2020 remains positive for most of the regional economies, many of their housing prices have edged down from their peak levels (Chart 2.7). Given that housing loans account for a significant share of outstanding bank loans in some of these economies (Chart 2.8), further corrections of the housing market should be carefully watched for possible repercussions to their banking systems.

Vulnerabilities are also noteworthy in economies that entered the pandemic with already high debt level and increased borrowing since then amid the extremely low-interest rate environment (Chart 2.9). With the ongoing global monetary tightening, their debt servicing burdens would increase. Debt overhang may pose risks to macro-financial stability through suppressing investment by viable corporates, or misallocating resources to financially unviable corporates. Some of these are also with a significant foreign currency debt and are therefore susceptible to foreign exchange risk. Indeed, Box 2 examines whether these corporates have hedged well against the risk, and how the development of FX derivatives markets in financial centres, such as Hong Kong, has been fostering the use of derivative hedge by corporates in the region.

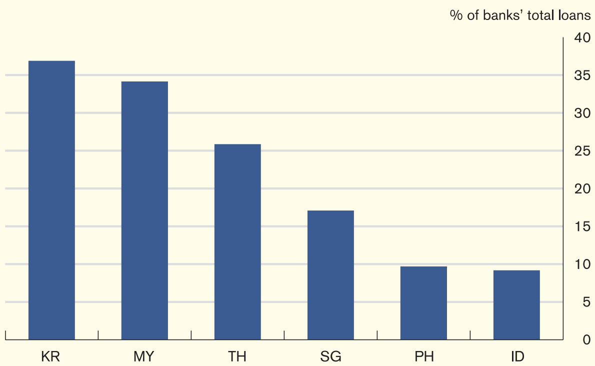
Weakening global demand is another factor that could weigh on the corporate performance and repayment capability of emerging Asia. If the region's export growth continues to lose momentum, this would render less support to the economic growth, therefore undermining firms' earnings and their ability to repay loans. Liquidity challenges facing heavily indebted firms could be further intensified.

Chart 2.7
Housing price changes since 2020



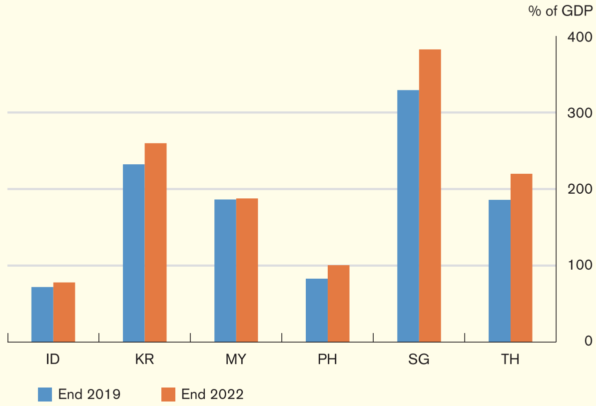
Note: "Peak" means the highest price level since 2020. For KR, the latest observation is Feb 2023; Jan 2023 for TH; Dec 2022 for ID and SG; Sep 2022 for the others.
Sources: CEIC and HKMA staff calculations.

Chart 2.8
Outstanding housing loans



Note: Jan 2023 data for MY; Sep 2022 for PH; Dec 2022 for other economies.
Source: CEIC.

Chart 2.9
Private and public debt since 2020



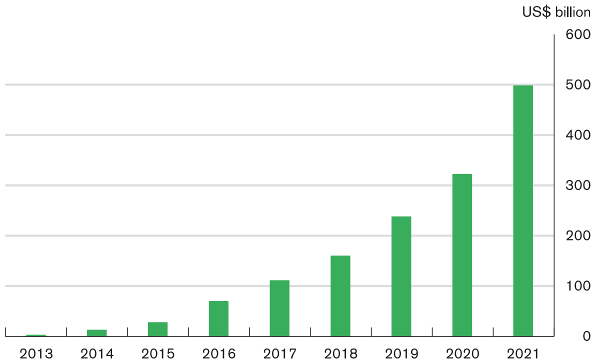
Note: Private and public debt refers to total debt incurred by households, nonfinancial corporates and governments.
Source: Institute of International Finance.

Box 1
Greenwashing in the corporate green bond markets

Introduction[2]

The global corporate green bond markets have seen rapid development over the past decade, with the outstanding amount of corporate green bonds rising at an annualised rate of 91% on average from US$2.8 billion at the end of 2013 to US$498.3 billion at the end of 2021 (Chart B1.1). The sizeable proceeds from green bonds should provide issuers with a large amount of capital to fund projects they pledge to undertake in delivering positive environmental benefits.

Chart B1.1
The outstanding amount of global corporate green bonds from 2013 to 2021



Sources: Bloomberg, Climate Bonds Initiative, Dealogic, Reuters and HKMA staff estimates.

However, it is often pointed out that some firms may engage in "greenwashing", meaning that they reap the benefits of issuing green bonds (e.g. enjoying a lower cost of funding, building a better corporate image) without delivering on what they have promised. For instance, the United Nations (UN) published a report that criticised greenwashing and provided guidelines to ensure credible net-zero pledges by businesses and other institutions.[3]

Greenwashing not only impedes progress in combating climate change, but could also pose risks to financial stability, as the unveiling of a firm's greenwashing behaviour may lead to an abrupt sale and repricing of its green bonds, with possible spill-over to other green assets. Against this backdrop, this box examines the issue of corporates' greenwashing behaviour by focusing on green bond markets and the policy implications for financial stability.

To what extent greenwashing behaviour prevails in corporate green bond markets?

Using our novel dataset that covers 1,371 green bonds issued globally by 371 listed firms from 2013 to 2021[4], we find that greenwashing is not uncommon in global green bond markets. Chart B1.2 reveals the distribution of change in aggregate greenhouse gas (GHG) emission intensity before and after the corporates issued their initial green bonds between 2013 and 2021.[5] It could be seen that some firms actually have a higher GHG emission intensity after their initial green bond issuance. As their GHG emission performances are inconsistent with the initiative of green bond issuance, these mixed signals could be taken by market participants as evidence of greenwashing.[6]

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[2] For details, please refer to Leung et al. (2022): "Greenwashing in the corporate green bond markets", *HKMA Research Memorandum 08/2022*.

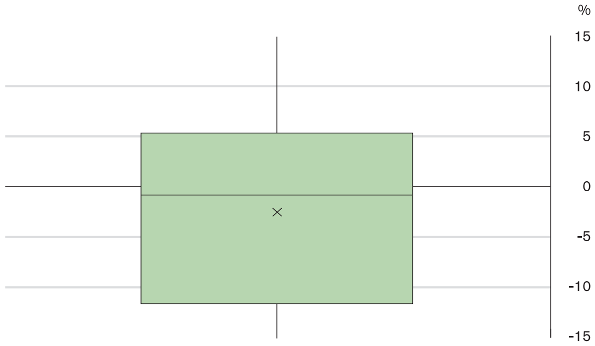
[3] For details, please refer to UN's High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities. (2022): "Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions".

[4] The dataset is constructed based on data from four main green bond data suppliers, Bloomberg, Climate Bonds Initiative, Dealogic and Reuters.

[5] For instance, assuming a green bond was issued in 2017, we would compare the average GHG emission intensity during 2017-2021 with that during 2013-2016.

[6] Some might argue that the "green" label may associate only with the use of proceeds from green bond issuance, and hence, there appears to be no commitment to getting "greener" for the overall operations of the company. Yet, from a broader perspective, issuing green bonds could be taken as a signal that the issuers are committed to environmental causes. If they do not take tangible action to cut down GHG emissions, this may be inconsistent with the initiative of the green bond issuance and send mixed signals to the markets. Investors may take this as evidence of greenwashing.

Chart B1.2
Change in average aggregate GHG emission intensity



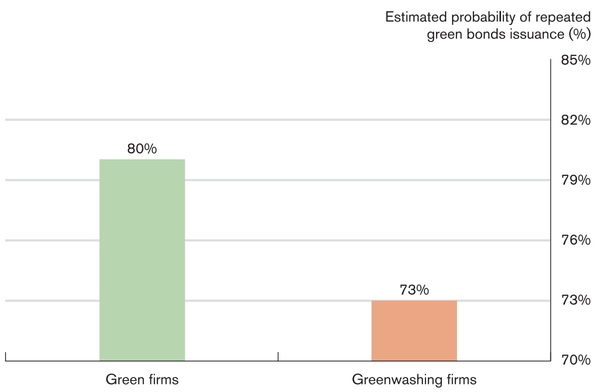
Note: The horizontal line inside the box represents the median value.
Sources: Trucost and HKMA staff estimates.

To what extent could the market identify and penalise the greenwashing behaviour?

With the evidence of greenwashing, we explore whether market participants could identify and penalise this behaviour.

First, our empirical analysis shows greenwashing firms are less likely to re-issue green bonds as compared to green firms. Specifically, the likelihood of re-issuing green bonds is 73% for a greenwashing firm (defined as those green bond issuers that increased the average aggregate GHG emission intensity since its initial green bond issuance), about seven percentage points lower than that for a green firm (Chart B1.3).

Chart B1.3
Probability of repeated green bonds issuance by green firms and greenwashing firms

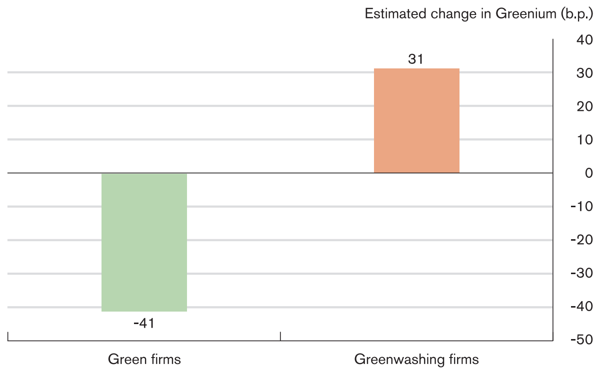


Note: This bar chart depicts the estimated probabilities of re-issuing green bond by green and greenwashing firms, by taking a typical firm (median values for all explanatory variables) for illustration.
Source: HKMA staff estimates.

Second, our empirical analysis shows that contrary to the green firms that can enjoy lower costs of re-issuance (i.e. more negative value of Greenium[7]), greenwashing firms are subject to higher costs in their repeated green bond issuance (Chart B1.4). Such higher issuance costs reflect a less favourable reception by investors, which in turn should act as a disincentive for some greenwashing firms from green bonds re-issuance.

To sum up, these findings suggest that investors may penalise greenwashing firms to some extent by demanding a higher yield. The higher issuance cost and less favourable market responses may also contribute to the lower re-issuance of green bonds by the greenwashing firms.

Chart B1.4
Change in Greenium by green firms and greenwashing firms



Note: The bar chart depicts the estimated Greenium of green bonds re-issued by green and greenwashing firms, by taking a typical firm (median values for all explanatory variables) for illustration. The Greenium is larger if its value is more negative.
Source: HKMA staff estimates.

7 Greenium refers to the yield spread of a green bond over a conventional bond with the same characteristics (e.g. same issuer and maturity). It is negative if the yield of a green bond is lower than that of its conventional counterpart, signaling that the firm can enjoy lower costs in issuing green bonds.

What could be done by governments to mitigate greenwashing behaviour?

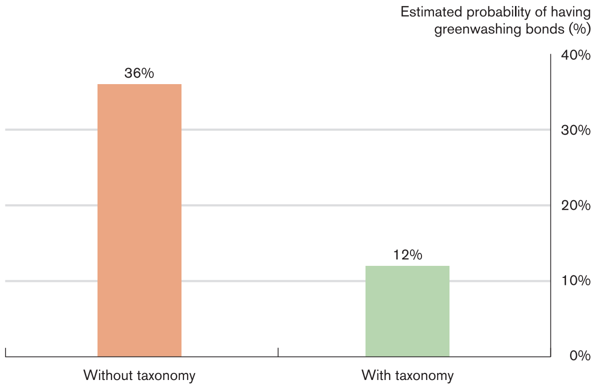
This section will evaluate the effectiveness of two key policies in mitigating greenwashing behaviour in corporate green bond markets, which are setting up green bond taxonomies and tightening environmental disclosure requirement.

1. Setting up green bond taxonomies

Standardisation in the definition and measurement of green bonds would help investors identify genuine green bonds. Therefore, a well-delineated green bond taxonomy may help mitigate greenwashing behaviour. The taxonomy also provides a guidance for issuers under which conditions the use of proceeds would be classified as green bonds.

Our empirical analysis suggests that the probability of having greenwashing bonds in economies with a green bond taxonomy is lower, by 24 percentage points, than those without a taxonomy (Chart B1.5). This suggests that a green bond taxonomy would help mitigate greenwashing behaviour in the green bond market.

Chart B1.5
Probability of having greenwashing bonds by economies with and without a taxonomy



Note: This bar chart shows the estimated probabilities of having greenwashing bonds in an economy with a green bond taxonomy and another one without a taxonomy.

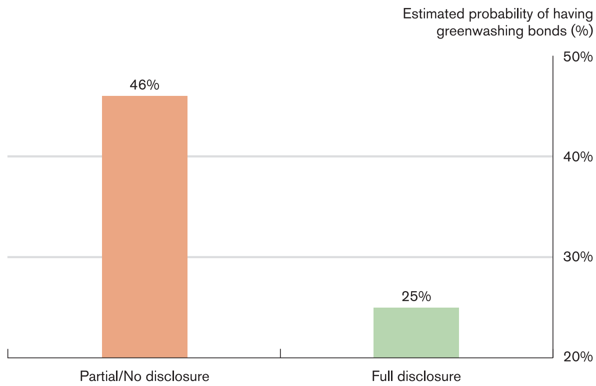
Source: HKMA staff estimates.

2. Tightening environmental disclosure requirements

A loose environmental disclosure requirement may also contribute to greenwashing behaviour, as it may provide a loophole for greenwashing firms to provide misleading information about their environmental performance. A more comprehensive environmental disclosure requirement would help investors to assess the environmental performance of corporates more accurately, thereby identifying greenwashing issuers in green bond markets.

Our empirical results suggest that a more stringent environmental disclosure may help investors make more informed decisions, and therefore could mitigate greenwashing behaviour. Specifically, it is found that the likelihood of having greenwashing bonds issued by firms with full environmental disclosure is about 21 percentage points lower than those with partial or no disclosure (Chart B1.6).

Chart B1.6
Probability of having greenwashing bonds by the extent of environmental disclosure by issuers



Note: This bar chart shows the estimated probabilities of having greenwashing bonds issued by corporates with full environmental disclosure and others with partial or no disclosure.

Source: HKMA staff estimates.

Conclusion and implications

To conclude, we reveal that greenwashing is not uncommon in global green bond markets. However, we find that the market may penalise greenwashing behaviour to some extent. Specifically, greenwashing firms are found to be less welcome by investors, as reflected by a lower chance and a higher cost of re-issuance of green bonds by greenwashing firms. Finally, this box also provides empirical support that a well-defined green bond taxonomy and a stricter environmental disclosure requirement would help mitigate greenwashing behaviour.

In line with the above findings, the HKMA has actively collaborated with other agencies under the Green and Sustainable Finance Cross-Agency Steering Group (CASG)[8] to explore developing a local green classification framework and make progress towards mandating climate-related disclosures aligned with the Task Force on Climate-related Financial Disclosures framework across relevant sectors by 2025. These initiatives would help advance Hong Kong's green and sustainable finance development.

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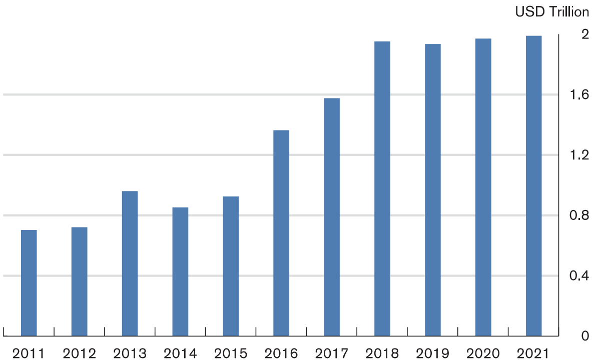
[8] The CASG was co-chaired by the HKMA and the Securities and Futures Commission. Other members include the Environmental Bureau, the Financial Services and the Treasury Bureau, Hong Kong Exchanges and Clearing Limited, the Insurance Authority and the Mandatory Provident Fund Schemes Authority.

Box 2
Foreign exchange risk and hedging of corporates in the EMEAP economies

Introduction

Under the low interest rate environment, firms in the EMEAP[9] economies had been able to easily tap funding in foreign currencies (FCs) in the past decade, resulting in a nearly threefold increase in corporate debts in FCs from 2011 to 2021 (Chart B2.1). The sizeable corporate debts in FCs may make EMEAP firms more vulnerable to adverse FX movements.

Chart B2.1
Outstanding amount of EMEAP corporate debts in FCs



Note: This bar chart depicts the outstanding amount of EMEAP corporate debts in FCs. FCs are defined as those other than the currency of a firm's domicile.
Sources: S&P Capital IQ and HKMA staff estimates.

The monetary policy tightening of central banks in major AEs since 2022 has weighed on many EMEAP currencies, potentially making EMEAP firms more difficult to repay their FC debts. This suggests a need for closer monitoring of FX risk management for corporates in the region. The first aim of this study is to investigate the extent to which corporates in the region hedge their FX risks.

This analysis also aims to answer whether, and to what extent, the development of FX derivative markets in the region could encourage corporates to hedge their FX risks using derivatives. Apart from assessing the impact of the development of domestic FX derivative markets on the use of FX derivatives by local corporates, we also examine whether the development of FX derivatives markets in the two financial centres in the region (i.e. Hong Kong and Singapore), which are deep FX hedging markets and offer open access for non-residents[10], may help corporates in other EMEAP economies manage FX risks.

To what extent EMEAP firms prepare for FX shocks?

To hedge against FX risk arising from borrowings in FCs, a firm can hold FC-denominated assets or earn FC revenue to reduce the negative impact of exchange rate fluctuations on repayment of their FC debt (i.e. natural hedge). Corporates may also hedge the FX risks with derivatives (i.e. derivative hedge).

Based on a sample of 2,339 constituents of representative equity indices in the EMEAP economies[11], we construct a database of their balance sheet information from 2011 to 2021. We further collect information on corporates' use of FX derivatives by carrying out text-mining analysis on the disclosure of FX risk management in their annual reports. Such disclosure usually

[9] EMEAP, the Executives' Meeting of East Asia-Pacific Central Banks, is a co-operative organisation of central banks and monetary authorities in eleven economies, including Australia, Mainland China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand.

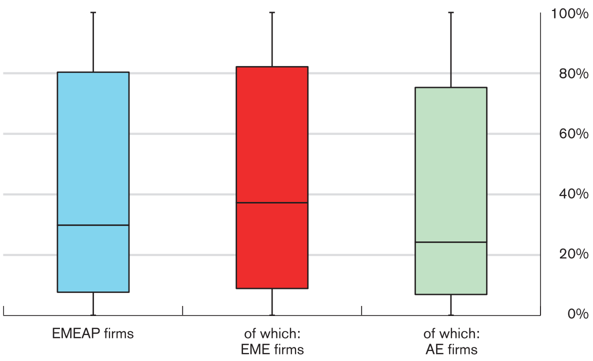
[10] Hong Kong is recognised for its efforts in boasting the most open access to FX hedging for non-residents. For details, please refer to the Bank for International Settlements (2022): "Foreign exchange markets in Asia-Pacific".

[11] The data is sourced from S&P Capital IQ. The indices include ASX 300, CSI 300, HSI, IDX Composite, Nikkei 225, KOSPI Composite, KLCI, NZX 50, PSEi, STI and SET 100. Some constituents are not included in our sample due to lack of their balance-sheet data.

contains information on whether they used FX derivatives. If a firm indicates that it held or hedged with FX derivatives, we classify it as an FX derivative user.[12] With this text-based measure, we can estimate how many EMEAP firms hedge with FX derivatives.

Using our novel dataset, we find that at the end of 2021, 79% of EMEAP firms in terms of asset size were exposed to FX risk arising from exchange rate fluctuations, as they had borrowed in FCs. Half of them had over 30% of debts in FCs (blue boxplot, Chart B2.2). Indeed, a quarter of them had over 80% of debt in FCs, suggesting significant FX risk. We also find that firms in EMEs tended to have a larger share of borrowing in FCs (red boxplot) than their counterparts in AEs (green boxplot).

Chart B2.2
EMEAP firms' debts in FCs as a share of their total debts at the end of 2021

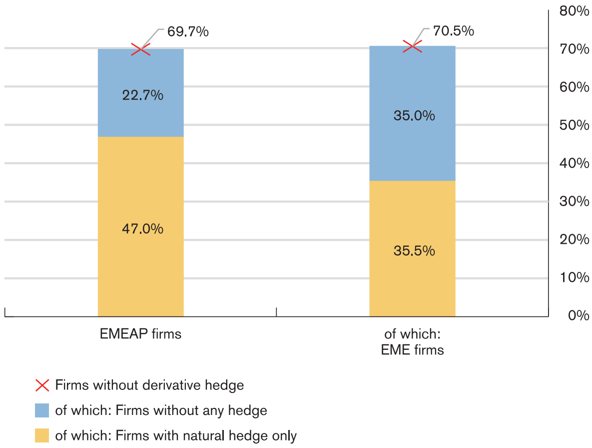


Notes:
(1) Each boxplot depicts the distribution of debts in FCs as a percentage of total debts for firms at the end of 2021; and
(2) "EME" includes Mainland China, Indonesia, Malaysia, the Philippines and Thailand, and "AE" refers to other EMEAP economies.
Sources: S&P Capital IQ and HKMA staff estimates.

Among the firms with FX risk, we find that the use of derivative hedges is not common, with 70% of them not using any FX derivatives (Chart B2.3). In addition, around a quarter of them did not employ either natural or derivative hedges.

Firms that under-hedge against FX risk may be able to withstand adverse FX shocks, if they have strong repayment ability. Our analysis, however, reveals that one-third of the under-hedged firms had their interest coverage ratio lower than one at the end of 2021, indicating that their earnings (as measured by the earnings before interest and tax, or EBITs) were not sufficient to pay for interest expenses. 22% of them even registered negative earnings. Without hedging against FX risk, these firms may be subject to a greater insolvency risk when their local currencies are under pressure.[13]

Chart B2.3
Share of EMEAP firms without derivative hedge at end-2021



Notes:
(1) This stacked column chart depicts the share of firms without derivative hedge at end-2021; and
(2) "EME" include Mainland China, Indonesia, Malaysia, the Philippines and Thailand.
Sources: S&P Capital IQ and HKMA staff estimates.

Under-hedging is found to be more prevalent among EME firms, with over one-third of them employing neither natural nor derivative hedges. This may be due mainly to the limited international business of EME firms. In fact, we found that 45% of them were without foreign assets (versus 31% for all EMEAP firms).[14] Hence, with a limited natural hedge, a derivative hedge

12 Firms may hold FX derivatives for non-hedging purposes. In this regard, we follow the literature by limiting our sample to firms with FC debts, which should have hedging needs for holding FX derivatives.

13 Our empirical analysis suggests that firms with FX derivatives could mitigate FX loss equivalent to 5.9% of their EBITs. The saving could even reach 9.5% of EBITs for firms with an above-median share of debts in FCs.

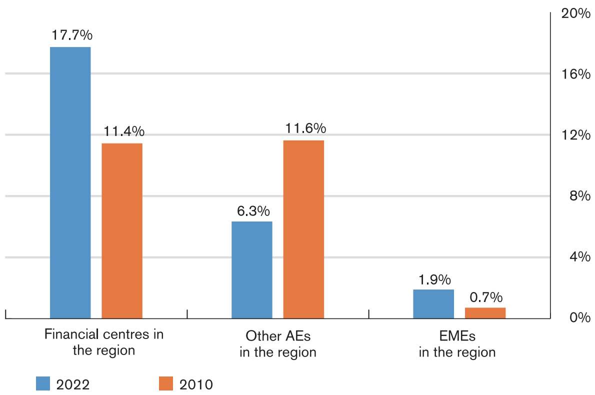
14 The results are robust if we measure the degree of international business by foreign revenues.

is even more important for their FX risk management. In the following section, we will discuss the growth of FX derivatives markets in EMEAP economies over the past decade, and assess whether they foster the use of a derivative hedge by firms in the region.

How did FX derivatives markets in EMEAP economies develop during the past decade?

Among EMEAP economies, the FX derivatives markets in Hong Kong and Singapore are deep, with daily average transactions accounting for 17.7% of the global aggregate in 2022, up from 11.4% in 2010 (Chart B2.4). Likewise, the EMEs in the region took up a larger share over the same period, but were still thin accounting for only 1.9% of global transactions in 2022.

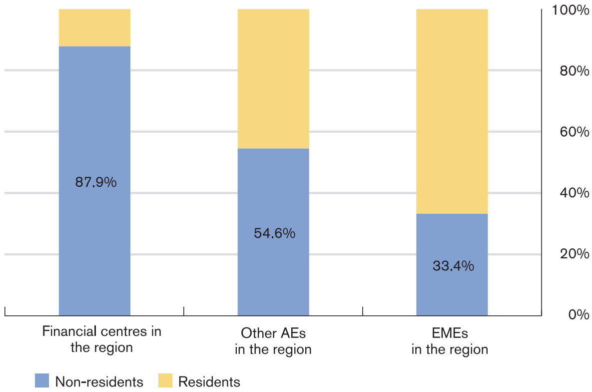
Chart B2.4
Daily average transaction of FX derivatives as a share of global transaction



Notes:
(1) This bar chart depicts daily average transaction of FX derivatives as a share of global transaction in 2010 (orange bars) and 2022 (blue bars), by trading places; and
(2) "Financial centres in the region" include Hong Kong and Singapore; "Other AEs in the region" cover Australia, Japan, South Korea and New Zealand; and "EMEs in the region" cover Mainland China, Indonesia, Malaysia, the Philippines and Thailand.
Sources: BIS Triennial Survey and HKMA staff estimates.

FX derivatives markets in the two financial centres in the region are also highly open to non-residents. Specifically, 87.9% of FX derivative transactions were undertaken by non-residents, higher than the shares of other AEs and EMEs in the region (Chart B2.5). The depth and openness of the FX derivatives markets in financial centres in the region suggest that they could provide alternative access to FX derivatives for firms whose domestic FX derivatives market remains underdeveloped.

Chart B2.5
Share of FX derivatives transacted by residents and non-residents in 2022



Notes:
(1) This stacked column chart depicts the share of FX derivatives transacted by residents (yellow portions) and non-residents (blue portions) in 2022, by trading places; and
(2) "Financial centres in the region" includes Hong Kong and Singapore; "Other AEs in the region" covers Australia, Japan, South Korea and New Zealand; and "EMEs in the region" covers Mainland China, Indonesia, Malaysia, the Philippines and Thailand.
Sources: BIS Triennial Survey and HKMA staff estimates.

Does the development of the FX derivatives market promote the use of FX derivatives by EMEAP firms?

We further examine whether the development of FX derivative markets promotes corporates to employ the derivative hedge.

1. Development of local FX derivatives markets

The development of local FX derivatives markets could provide a deeper pool of instruments to meet corporates' hedging demand. Hence, a more mature local FX derivatives market should promote the use of FX derivatives among the corporates.

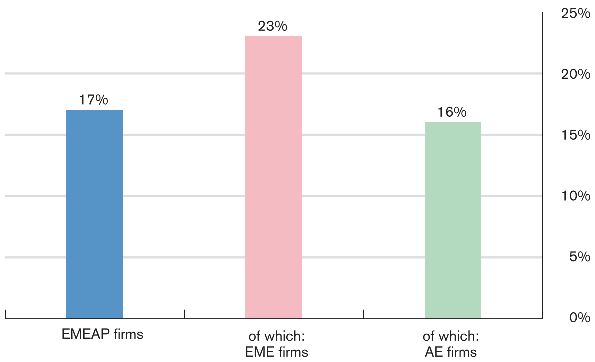
Indeed, our empirical analysis suggests that the probability of firms using FX derivatives would increase by 26% for one percentage point increase in their local market's share of global FX derivative transactions. This shows that, as local derivatives markets mature, more local firms can gain access to FX derivatives for hedging.

2. Development of FX derivatives markets in financial centres in the region

Some EMEs may take time to develop their FX derivative markets. With a limited choice in the local market, the much deeper markets in the financial centres in the region may offer more choices and lower costs for corporates in EMEs within the same region to hedge their FX risks.

Our empirical analysis confirms the above conjecture and suggests that, in the case of EMEAP economies, the likelihood of firms using FX derivatives would rise by 17% for one percentage point increase in financial centres' share of global FX derivative transactions (Chart B2.6). The effect is even more pronounced among EME firms (i.e. 23%), as they tend to be more reliant on financial centres in the region for hedging FX risks. These results suggest a crucial role of the derivative markets in financial centres in the region in facilitating FX risk management of EMEAP corporates, especially for those in EMEs.

Chart B2.6
Estimated change in the probability of firms using FX derivatives, by domicile economies



Note: This bar chart depicts the change in the probability of firms using FX derivatives for a percentage point increase in the share of global FX derivatives transactions of the financial centres in the region.

Source: HKMA staff estimates.

Conclusion and implications

To sum up, we reveal that while there has been rapid growth in FC debts among corporates in the EMEAP economies, the hedging of FX risks using derivatives is found to be limited, particularly for those corporates in EMEs, which often have a lesser degree of natural hedge due to limited foreign business. As central banks in major AEs may keep their interest rates high for longer to contain inflation risks, these corporates may face significant pressure in managing their FX risks due to fluctuation in the local currency exchange rate.

Our empirical analysis also shows that the development of FX derivative markets is important for corporates to manage their FX risks. In particular, this analysis provides empirical support that development of FX derivatives markets in financial centres in the region could promote the use of FX derivatives by EMEAP firms, particularly for those in EMEs, thereby strengthening their resilience to FX shocks.

References

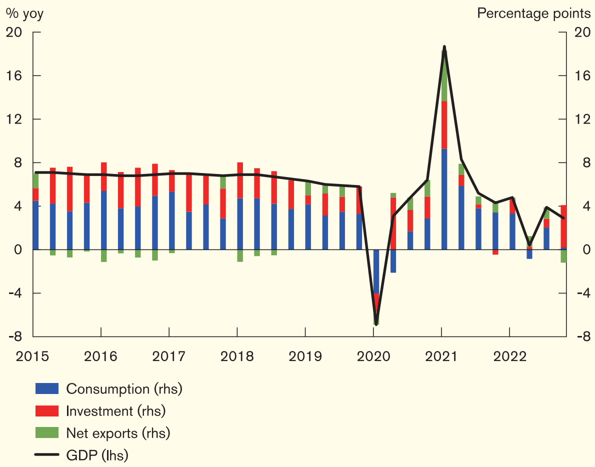
Bank for International Settlements. (2022). *Foreign exchange markets in Asia-Pacific*.

2.2 Mainland China

Economic performance and policy response

Mainland China's year-on-year real GDP growth moderated to 2.9% in the fourth quarter from 3.9% in the third quarter amid nationwide COVID-19 outbreaks following the easing of pandemic controls, prolonged property market downturns and weakened global demand (Chart 2.10). For 2022 as a whole, Mainland China's real GDP growth dropped to 3.0% from 8.1% in 2021 amid various challenges.

Chart 2.10
Mainland China: Contribution to GDP growth by demand component



Sources: CEIC, National Bureau of Statistics of China (NBS) and HKMA staff estimates.

Looking ahead, the resurgence in private consumption following the relaxation of COVID-19 restrictions may fuel an acceleration of Mainland's economic growth in 2023. That said, the pace of the economic recovery remains uncertain, depending much on the COVID-19 situation and the resumption of economic activities. In addition, given the strong linkages between the real estate sector and the rest of the economy, property market conditions may remain weak in the near term and continue to weigh on economic activities before stabilising gradually on the back of the supportive measures introduced by the authorities. (Box 3 discusses the impacts of the real estate sector slowdown on the other economic segments). Externally, the exports of goods may remain sluggish due to weakening demand from advanced economies where the odds of a recession are rising on monetary policy tightening. The government set the growth target for 2023 at around 5%, while the latest consensus forecasts expected the Mainland economy to expand by 5.2% in 2023.

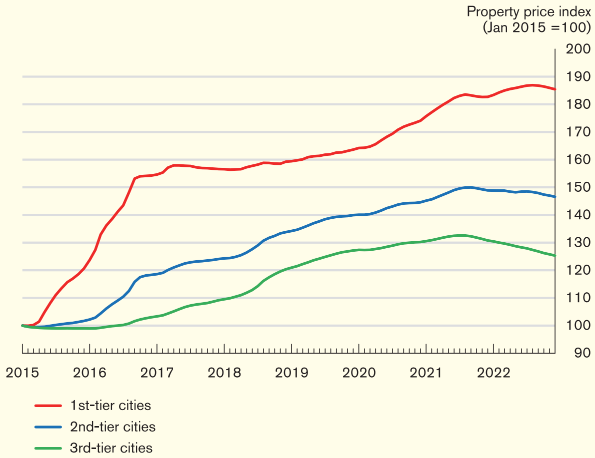
For inflation, while food (including pork) prices edged up during the second half of 2022, in part due to the low base effect and regional outbreaks of swine diseases, Mainland China's headline consumer price inflation remained subdued at 1.8% year on year in December 2022 partly reflecting weak domestic demand amid the COVID-19 outbreaks. In the period ahead, Mainland's inflationary pressures are expected to edge up along with the easing of COVID-19 restrictions, but will likely remain moderate. The latest consensus forecasts expect Mainland's consumer prices to rise mildly by 2.4% for 2023 as a whole.

In light of the uncertainties surrounding the growth outlook, the latest Central Economic Work Conference held in December 2022 and the Two Sessions held in March 2023 set stabilising the economy as a top priority for 2023, calling for the shoring up of business confidence by pushing forward structural reforms, such as treating SOEs and POEs equally, and boosting domestic demand especially consumption. The authorities noted that monetary policies should be targeted and forceful, with a focus on providing reasonable and ample liquidity to the real economy, as well as directing financial institutions to step up support for micro and small businesses, technological innovation and green development through structural tools. Fiscal policies will be more forceful and effective with an optimised combination of deficit, special bonds, interest subsidies and other tools to ensure the quality of economic growth, while maintaining fiscal sustainability and keeping the risk of local government debt under control.[15]

Asset and credit markets

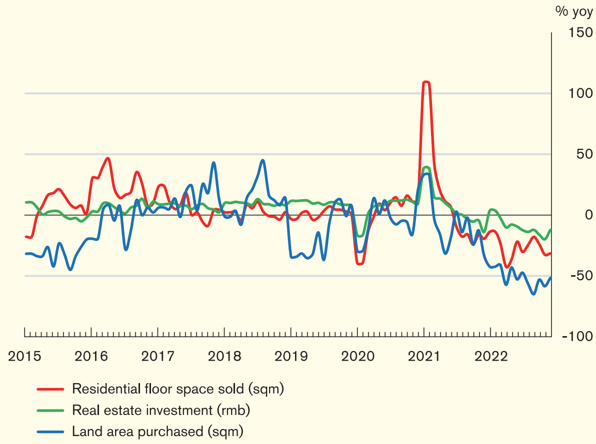
In the second half of 2022, Mainland property market conditions stayed weak, in part because of the still-jittery homebuyers' confidence and the COVID-19 outbreaks nationwide. Housing prices softened in all tiers of cities (Chart 2.11), while residential floor space sold, real estate investment and land area purchases deteriorated further (Chart 2.12).

Chart 2.11
Mainland China: Residential property prices by tier of cities



Sources: CEIC and HKMA staff estimates.

Chart 2.12
Mainland China: Residential floor space sold, real estate investment and land purchase



Sources: CEIC and HKMA staff estimates.

To stabilise the property market, the authorities have introduced comprehensive policy support since the 20th National Congress to mitigate liquidity issues facing developers, secure the delivery of presold housing projects, and support housing demand. For instance, a series of measures dubbed "Three Arrows", which were aimed to enhance the access of property developers to bank, bond and equity financing,[16] was introduced in the fourth quarter of 2022. To boost housing demand, a tax incentive programme was developed for residents who plan to sell old homes and purchase new homes within one year. At the local level, authorities eased home purchase restrictions and lowered the down payment ratios especially in lower-tier cities, and established a mortgage rate

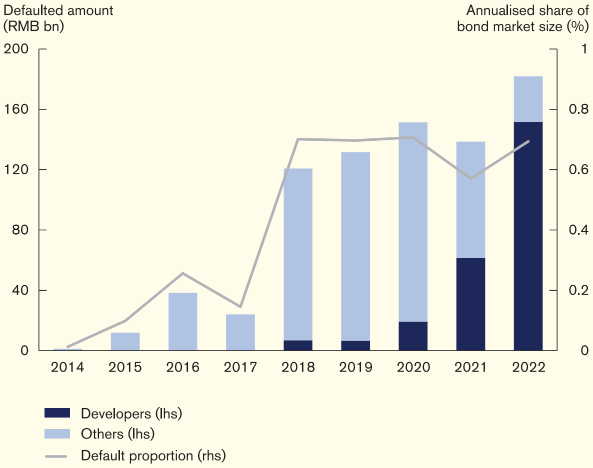
[15] At the end of 2022, Mainland's local government debt-to-GDP ratio remained low at 29%, despite a mild increase from last year.

[16] More specifically, supportive measures on bank financing include: (1) "16 measures" and comprehensive credit line agreements signed between large banks and developers to provide intentional financing of at least RMB4 trillion, according to market estimates; (2) "window guidance" given to the top four state-owned banks to issue offshore loans to help some developers repay their offshore debt. Measures on bond financing include a RMB250 billion bond programme of the National Association of Financial Market Institutional Investors for POEs. On equity financing, the authorities have lifted the restrictions on restructuring/M&As and equity refinancing of A- and H-share listed developers, and permitted qualified private developers to go public through backdoor listings by acquiring listed developers, as well as restructurings between listed developers and listed companies in property-related sectors.

adjustment mechanism allowing more flexibility for eligible cities to adjust the minimum mortgage rates for first-home buyers.

Amid the mitigating measures rolled out by the government, the total amount of Mainland property developer bond defaults in the onshore market fell to RMB71 billion in the second half of 2022 from RMB81 billion in first half. In 2022, the annualised default rate in the onshore corporate bond market remained low at around 0.7%, with property developers contributing more than 80% of the total onshore bond defaults (Chart 2.13).

Chart 2.13
Mainland China: Bond default size and rate in the onshore market



Note: Repeated defaults of the same bond are only counted once. Data covers enterprise and corporate bonds, medium-term notes, short-term commercial papers and private placement notes listed in both the interbank market and exchanges.
Sources: Wind and HKMA staff estimates.

The overall risk in the Mainland banking sector remained under control. The average non-performing loan (NPL) ratio of state-owned banks stayed low and further declined to 1.31% in December 2022 from 1.34% six months earlier (Chart 2.14) partly due to loan write-offs. The provision coverage ratio of large Mainland banks stayed at 245% in December 2022, well above the regulatory requirement. That said, amid increased economic uncertainties and a weak property market, the asset quality pressures facing some smaller banks should not be ignored, in part due to their higher exposures to the property market. In particular, the NPL ratio of rural commercial banks stayed at a relatively high level of 3.2% in December 2022 despite showing a falling trend over the past year.

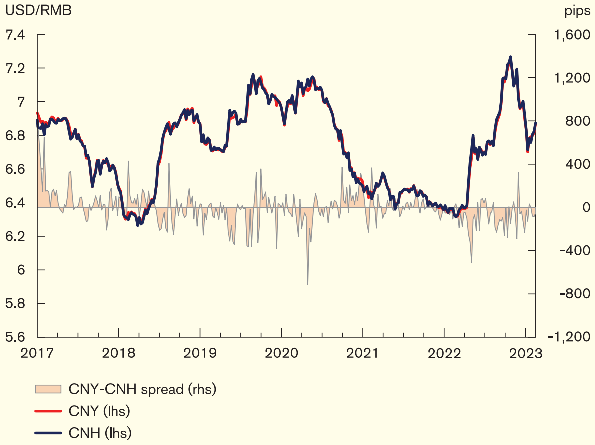
Chart 2.14
Mainland China: NPL ratio by bank type

Source: CEIC.

Exchange rate and cross-border capital flows

Amid the expectations of an economic recovery in Mainland China following its adjustment of COVID-19 restrictions and the slower pace of interest rate hikes in the US, the onshore renminbi (CNY) strengthened remarkably against the US dollar in November and December 2022 after hitting a 14-year low in October. However, the appreciation trend had reversed since February amid a stronger US dollar on market expectations of an extended period of US monetary tightening. The offshore renminbi (CNH) exchange rate, in comparison, was traded lower than its onshore counterpart for most of the review period (Chart 2.15).

Chart 2.15
Mainland China: Onshore and offshore renminbi exchange rates against the US dollar



Sources: Bloomberg and HKMA staff estimates.

The latest balance of payments statistics suggested that while rising holdings of overseas security investments by residents as well as the unwinding of the positions in the Mainland bond market by foreign investors had led to increased net capital outflows in the third quarter of 2022, foreign direct investment continued to register net inflows. In tandem with its strengthening currency, capital outflow pressures facing Mainland China have eased since the fourth quarter of 2022, with the official foreign exchange reserves staying above US$3 trillion at end-February 2023. Looking ahead, short-term cross-border capital flows may remain volatile. On the one hand, the Mainland China-US interest rate gap may persist, due to interest rate hikes in the US and the pro-growth monetary policy stance in Mainland China. On the other hand, the further opening up of the Mainland financial markets, together with the ongoing economic recovery, may continue to attract more capital inflows.

Box 3
Assessing the impact of the property market downturn on the Mainland economy through the input-output linkages

Introduction

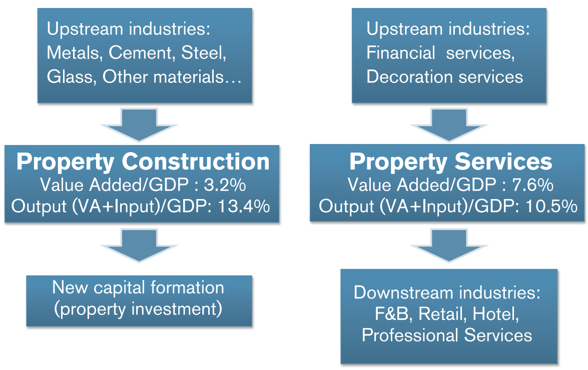
The sharp slowdown in the property market was one of the most significant developments of the Mainland economy in 2022. The sector has been a crucial driver of Mainland's economic growth, given its widespread linkages with the rest of the economy.[17] As the downward pressures on the property sector intensified and many developers struggled to repay debts, natural questions arise as to how the upstream and downstream industries of the property sector have been affected by the market downturn, and how large the associated risks could be. This Box sheds some light on these questions by quantifying the linkages of the property sector with the other sectors of the economy using a model-based approach developed by Acemoglu, Akcigit and Kerr (2016).[18]

Linkages between the property sector and the rest of the economy

The property sector is typically defined as the combination of property construction, which pertains to the flow of new buildings, and property services, which relates more to real estate sales and management. Some simple calculation based on the 2020 Input-Output table of Mainland China could reveal the size of the linkages between the sector and the rest of the economy: while the whole sector's value added only contributes to 10.8% of Mainland China's GDP, its total output, which is equal to the sum of the value added and intermediate input expenditure, accounts for almost a quarter (23.9%) of Mainland's GDP.

A closer examination of the linkages of the property sector reveals that the two components, namely property construction and property services, have substantially different upstream/downstream relationships. In particular, Figure B3.1 shows that the linkages of property construction are solely to the upstream as all of its output is converted into new investment, while property services are linked to both upstream and downstream sectors. This suggests that property construction is generally more prone to demand-side shocks which in theory would propagate only to upstream sectors.

Figure B3.1
Input-output linkages of the property construction and property service sector



Sources: NBS and HKMA staff estimates.

In addition, our calculations based on the Input-Output table show that property construction has a much higher output-to-value added ratio of 4.2, compared with 1.4 for property services.[19] This suggests that for a demand shock of the

[17] For example, Yi Gang, the Governor of the PBoC, said at the Annual Conference of Financial Street Forum in November 2022 that "the healthy development of the property sector is of great importance to the overall economy as it is linked to many upstream and downstream industries".

[18] The model considers a perfectly competitive economy with input-output linkages and standard Cobb-Douglas substitution assumptions. It is adopted as a benchmark framework to model demand-side shocks by Carvalho and Tahbaz-Salehi (2019).

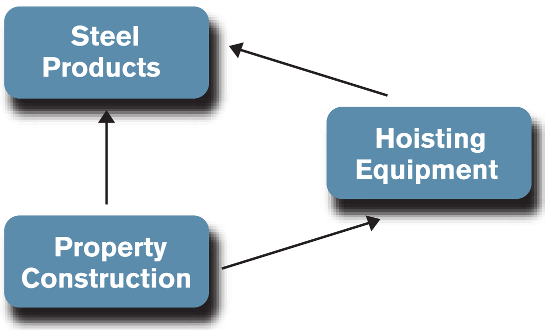
[19] The property construction sector has an output/GDP ratio of 13.4% and a value added/GDP ratio of 3.2%; the property service sector has an output/GDP ratio of 10.5% and a value added/GDP ratio of 7.6%.

same size hitting each sector, property construction can generate an aggregate impact that is about two times larger than that of property services, due to the former's broader and stronger linkages to the upstream sectors.

Model-implied impacts of demand shocks

A demand shock to the property sector, such as a deterioration in homebuyers' confidence, affects the upstream sectors (i.e. suppliers) through both direct and indirect channels as depicted in Figure B3.2. For instance, a decline in property investment triggered by developers' expectations of declining housing demand will not only directly affect the steel sector by reducing construction firms' purchase of steel products, but also indirectly affect the steel sector by reducing its demand for hoisting equipment, which itself is an intensive user of steel inputs.

Figure B3.2
An illustration of direct and indirect effects of a demand-side shock



Our estimated model-implied impacts, which take into account both direct and indirect effects, are presented in Table B3.1 below. In particular, in the face of a hypothetical 100% decrease in property investment, many upstream sectors would suffer severe output losses, among which the most affected industrial sectors are cement (-59%), stone and glass (-49%), and mining (-39%). In comparison, only a few service sectors (i.e. finance (-12.5%), commercial (-11.1%)) would be relatively hard hit if the demand for property services were fully eliminated. These results demonstrate that property construction is clearly a much more powerful transmitter of demand shocks, thus shaping the overall impact of the property sector downturn on the rest of the economy.

Table B3.1
Model-implied impacts of a hypothetical demand shock to the property sector

	Construction	Services	Overall
Agriculture	-5.4%	-1.3%	-6.7%
Mining	-39.1%	-2.5%	-41.6%
Food	-3.8%	-1.5%	-5.3%
Trad. Manufacturing	-5.4%	-2.9%	-8.3%
Wood	-26.6%	-1.9%	-28.6%
Fuel	-17.4%	-2.2%	-19.6%
Chemical	-13.3%	-1.3%	-14.6%
Cement	-58.9%	-0.2%	-59.1%
Stone & Glass	-48.9%	-0.6%	-49.5%
Steel	-34.8%	-0.7%	-35.4%
Non-ferrous Metal	-18.4%	-1.4%	-19.8%
Other Materials	-28.6%	-2.5%	-31.2%
Equipment & Machinery	-8.6%	-0.9%	-9.5%
Electronics	-5.7%	-1.0%	-6.7%
Recycling & Repair	-25.7%	-1.4%	-27.0%
Electricity & Heat	-16.2%	-2.5%	-18.7%
Decoration	-9.1%	-3.1%	-12.2%
Wholesale & Retail	-12.0%	-1.4%	-13.4%
Transportation	-12.0%	-2.1%	-14.1%
Hotel & Restaurant	-7.6%	-3.5%	-11.1%
Telecommunication	-9.7%	-2.8%	-12.5%
IT	-6.4%	-2.3%	-8.7%
Finance	-11.3%	-12.5%	-23.9%
Rental Trade	-28.6%	-1.8%	-30.4%
Commercial	-10.0%	-11.1%	-21.1%
Professional	-9.1%	-0.6%	-9.7%
Other Services	-1.9%	-0.5%	-2.5%

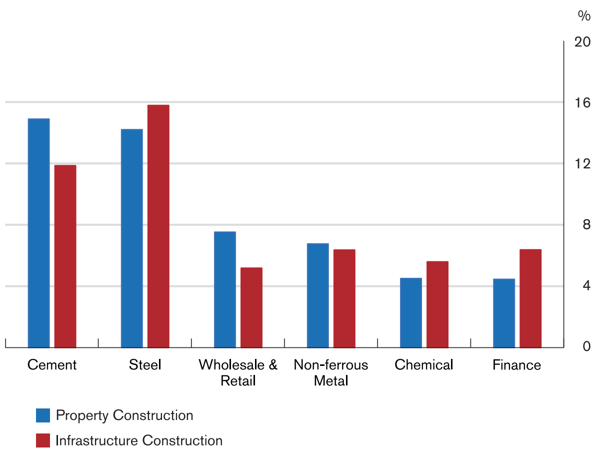
Sources: NBS and HKMA staff estimates.

The mitigating role of infrastructure investment

Despite the slowdown in property construction activities, upstream industrial suppliers seem to have held up relatively well so far, as reflected by few reported bond defaults observed in those sectors in contrast to the large number of property developer defaults lately. One possible explanation is that the adverse impacts on the upstream sectors may have been offset by the increase in infrastructure investment.

The reason lies in the fact that property and infrastructure construction sectors exhibit: (1) similar linkage patterns as displayed by their respective input coefficients calculated from the 2020 Input-Output Table (Figure B3.3); and, (2) similar output-to-value-added ratio of around four.[20] The similarity of their input-output linkages and multiplier effects therefore means that the increase in infrastructure construction could be effective in offsetting the impact of the decrease in property construction on the upstream sectors.

Figure B3.3
Key input coefficients of the property and infrastructure construction sectors



Note: Input coefficients are calculated for the property or infrastructure construction sector as the percentage shares of its total intermediate input expenditure allocated to the upstream sectors.
Sources: NBS and HKMA staff estimates.

Table B3.2 reports the estimated model-implied impacts on the output of a few selected upstream sectors calculated based on the property and infrastructure investment figures in 2022.[21] Indeed, the net impacts on some property-sensitive sectors, such as steel and rental trade service, turned out to be quite small, confirming the strong mitigating effects of infrastructure investment. In aggregate, the slowdown in property investment dragged GDP growth down by roughly 1.3%, of which about 0.9% was offset by the growth in infrastructure investment.

Table B3.2
Model-implied impacts on major upstream sectors based on 2022 investment figures

	Property	Infrastructure	Net
Mining	-3.9%	2.6%	-1.3%
Fuel	-1.7%	1.6%	-0.1%
Chemical	-1.3%	0.9%	-0.4%
Cement	-5.9%	3.1%	-2.8%
Steel	-3.5%	2.4%	-1.1%
Non-ferrous Metal	-1.8%	1.1%	-0.7%
Electricity & Heat	-1.6%	1.0%	-0.6%
Decoration	-0.9%	0.9%	0.0%
Transportation	-1.2%	0.7%	-0.5%
Finance	-1.1%	0.9%	-0.3%
Rental Trade	-2.9%	2.0%	-0.8%
Commercial	-1.0%	0.7%	-0.3%
Overall economy (GDP)	*-1.3%*	*0.9%*	*-0.4%*

Sources: NBS and HKMA staff estimates.

In comparison, the adverse impacts from deteriorated business activities in property services can hardly be mitigated by infrastructure spending as the two sectors have substantially different input-output structure. In particular, our calculation suggests that the slowdown in property services had dragged GDP growth by about 0.5% in 2022, which worked mainly through the sector's own high value added (around 0.4%) rather than its demand-side linkages.

Conclusion

Using a model-based approach, this study quantifies how the ongoing property market slump could affect the other segments in the economy through input-output linkages. We find that while the impacts of the decline in property investment were large for some upstream suppliers, much of them were offset by the increase in infrastructure investment due to the similarity in the input-output linkages of the property and infrastructure construction sectors. That said, it appears that public spending on infrastructure alone may not be able to

[20] The infrastructure construction sector has an output/GDP ratio of 9.5% and a value added/GDP ratio of 2.4%.

[21] According to NBS, the 2022 full-year growth rates of property investment and infrastructure investment were -10.0% and +9.4% respectively.

effectively address the adverse impact from a slowdown in property services.

References

Acemoglu, D., Akcigit, U., and Kerr, W. (2016). "Networks and the macroeconomy: An empirical exploration.", *NBER Macroeconomics Annual*, 30(1), pages 273-335.

Carvalho, V. M., & Tahbaz-Salehi, A. (2019). "Production networks: A primer.", *Annual Review of Economics*, 11, pages 635-663.

3. Domestic economy

Hong Kong's economy contracted visibly in the second half of 2022 reflecting sizeable declines in merchandise exports and investment spending. Economic growth for 2023 is expected to recover from a low base on the back of the reopening of Mainland China and Hong Kong. But the outlook is subject to risks and uncertainties relating to the US policy rate path, softer growth of the advanced economies, lingering geopolitical tensions and the recovery pace of Hong Kong's inbound tourism. Labour market conditions are likely to improve further as local economic activities return to normal. Local inflation is expected to edge up in the near term along with the economic recovery, but should stay mild in general.

3.1 Real activities

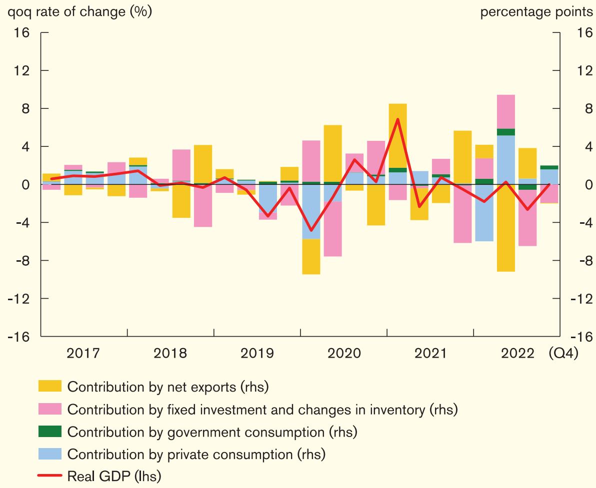
Hong Kong's economy contracted visibly in the second half of 2022. Year on year, real GDP declined further by 4.6% and 4.2% in the third and fourth quarters respectively (Table 3.A). For 2022 as a whole, real GDP dropped by 3.5%, contrasting with the 6.4% growth in 2021.

Table 3.A
Real GDP growth

		Seasonally adjusted quarter-on-quarter growth rate (%)	Year-on-year growth rate (%)
2021	Q1	6.9	8.2
	Q2	-2.3	7.6
	Q3	0.7	5.5
	Q4	-0.5	4.7
2022	Q1	-1.8	-3.9
	Q2	0.3	-1.2
	Q3	-2.6	-4.6
	Q4	0.0	-4.2

Source: Census and Statistics Department (C&SD).

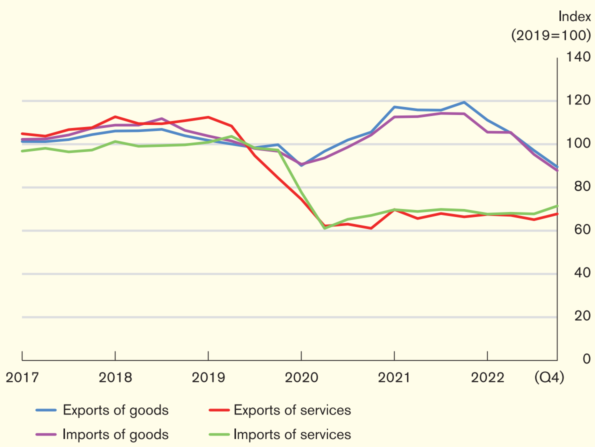
Chart 3.1
Real GDP growth and contribution by major expenditure component



Note: Growth rates are seasonally adjusted.
Sources: C&SD and HKMA staff estimates.

On a quarter-on-quarter basis, economic activities fell by 2.6% in the third quarter but showed little change in the final quarter (Table 3.A and Chart 3.1). Domestically, private consumption was supportive to economic growth, thanks to the progressive relaxation of social distancing measures, improving labour market conditions and a boost from the Consumption Voucher Scheme. However, aggregate investment spending dropped in the second half of 2022 amid generally soft business sentiment[22] and rising borrowing costs. Externally, the deteriorated external environment and the disruptions to cross-boundary truck movements between Mainland China and Hong Kong posed visible drags on Hong Kong's merchandise export performance, while trade in services slightly edged up following the relaxation of the compulsory quarantine requirements for overseas visitors since late September 2022 (Chart 3.2). However, net trade contributed positively to GDP for the second half of 2022 as a whole partly because merchandise imports declined at a slightly faster pace than exports.

Chart 3.2
Export and import volume



Note: The data are seasonally adjusted.
Source: C&SD.

Hong Kong's economic growth for 2023 is expected to recover from a low base with the reopening of Mainland China and Hong Kong. While the expected weaker growth of the advanced economies will continue to weigh on Hong Kong's exports of goods, a recovery in the Mainland economy and the lifting of restrictions on cross-boundary land transportation with the Mainland could provide some support. The reopening of Mainland China and Hong Kong should also greatly benefit Hong Kong's inbound tourism and other exports of services (e.g. cross-boundary financial activities), as well as local business sentiment and capital spending. Box 4 discusses the recent revival of visitor arrivals into Hong Kong, and provides evidence that the delayed reopening of Hong Kong relative to other regional economies is expected to have a limited and transitory impact on inbound tourism, with negligible scarring effect. Private consumption will also improve further along with a stronger labour market. The Government also announced in the 2023-24 Budget fiscal measures to create a stronger impetus to economic recovery.[23] The Government forecasts real GDP growth for the whole of 2023 in the range of 3.5% to 5.5%, and the growth estimates by private-sector analysts average 3.7%. That said, the growth outlook is fraught with risks and uncertainties as discussed in previous chapters, especially those relating to the US Fed's policy rate path, global growth prospects, lingering geopolitical tensions and the recovery pace of Hong Kong's inbound tourism.

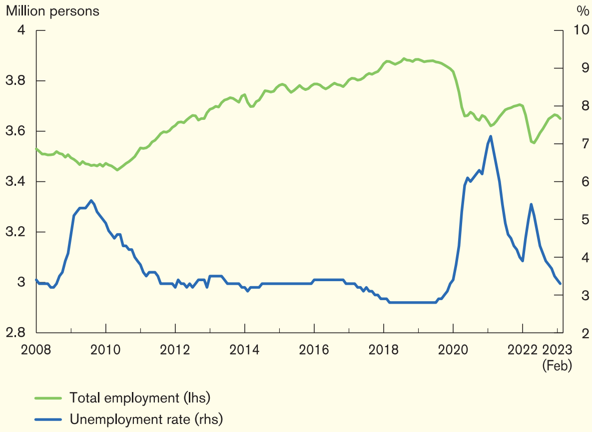
3.2 *Labour market conditions*

Alongside the further relaxation of social distancing measures, local labour market conditions continued to improve in the second half of 2022 and early 2023. The seasonally adjusted unemployment rate declined further to 3.3% in February 2023 (Chart 3.3). Total employment also rebounded from a recent low in May 2022, albeit still below its pre-pandemic level. Looking ahead, the labour market is likely to improve further as local economic activities return to normal.

[22] The Purchasing Managers' Index remained in the contractionary zone (below 50) between September and December 2022.

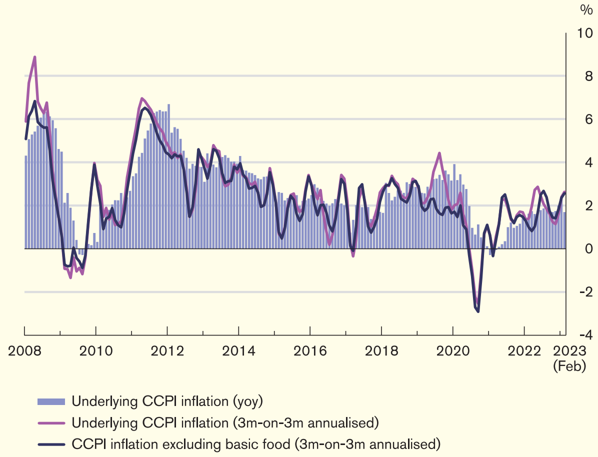
[23] These measures include, among others, a one-off provision of HK$5,000 electronic consumption vouchers to each eligible resident and tax reductions for both salaries and profits taxes. The Government estimates that the 2023-24 Budget would stimulate the economy by about 1% of GDP.

Chart 3.3
Labour market conditions



Source: C&SD.

Chart 3.4
Different measures of consumer price inflation

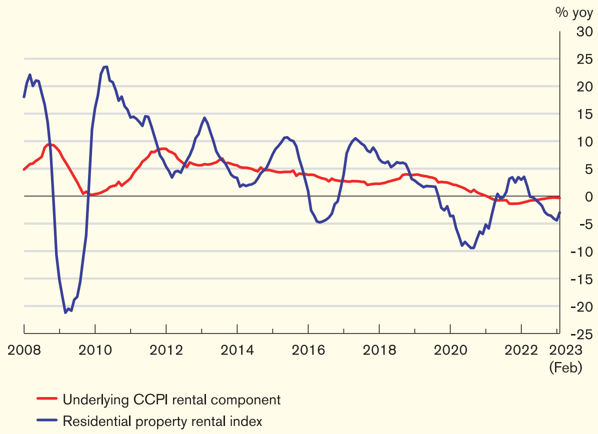


Sources: C&SD and HKMA staff estimates.

3.3 Inflation

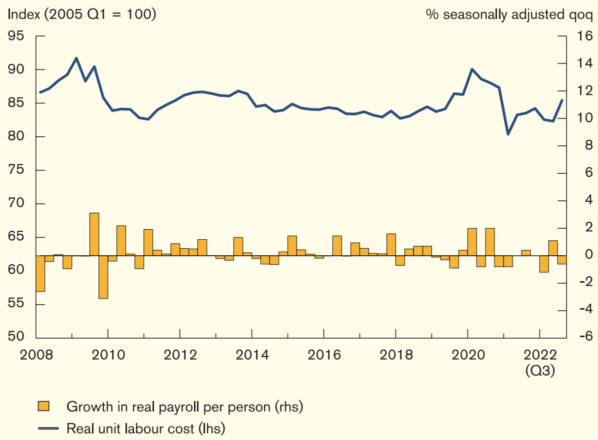
Local inflationary pressures remained moderate in recent months. The year-on-year underlying composite consumer price index (CCPI) increased by 1.8% in both the third and fourth quarters of 2022, and by 2.1% in January and February 2023 combined,[24] mainly driven by prices of energy-related items, food, and clothing and footwear. Inflation momentum, as measured by the annualised three-month-on-three-month underlying inflation rate, also stayed mild recently (Chart 3.4). In conjunction with the soft housing market, the housing rental component of the CCPI has exerted downward pressure on overall inflation (Chart 3.5). Real unit labour costs remained generally soft, despite a slight pickup in the third quarter of 2022 (Chart 3.6). External price pressures were still intense amid the elevated import prices, but their pace of increase moderated in recent months (Chart 3.7).

Chart 3.5
CCPI rental component and market rental



Sources: C&SD and Rating and Valuation Department (R&VD).

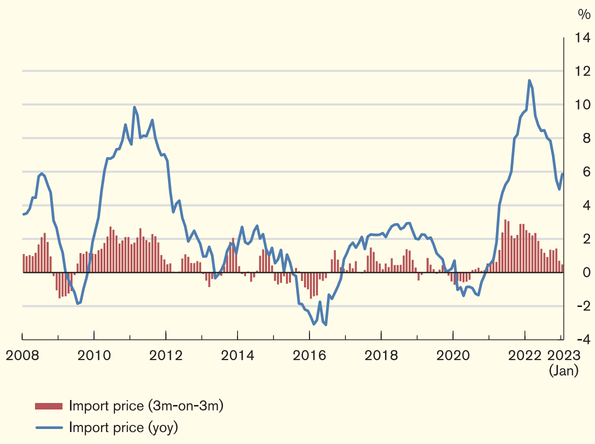
Chart 3.6
Unit labour cost



Sources: C&SD and HKMA staff estimates.

[24] Inclusive of the effects of the Government's relevant one-off relief measures, the year-on-year headline inflation rate was 2.7% and 1.8% in the third and fourth quarters of 2022, and 2.1% in January and February 2023 combined.

Chart 3.7
Hong Kong's import prices



Source: C&SD.

In the near term, local inflation is expected to edge up, but should stay mild reflecting offsetting forces. While external prices should remain elevated, their upward momentum will likely moderate further alongside weaker economic activities in some major economies and easing upward pressure on commodity prices. Domestic cost pressures may edge up together with the recovery in the economy and the labour market, but the soft housing rentals should provide some offset. The Government projection of underlying and headline inflation rates for 2023 is at 2.5% and 2.9% respectively, and the latest market consensus forecasts the headline inflation rate for 2023 to be 2.4%.

Box 4
Will Hong Kong experience a scarring effect on visitor arrivals due to the delayed reopening?

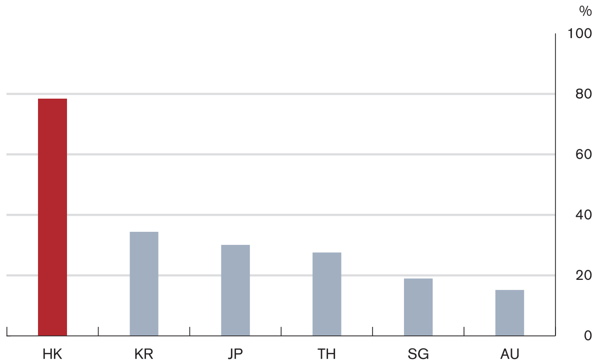
Introduction

Following the stabilisation of the local COVID-19 epidemic situation, the Government announced multiple rounds of relaxation measures, including the "0+3" arrangement[25] in September 2022, the lifting of the Amber Code requirement[26] in December 2022 and the resumption of normal travel between Hong Kong and Mainland China[27] in January and February 2023. As some regional economies have already gradually reopened since early 2022, there may be a concern that the delayed reopening of Hong Kong might have caused a scarring effect on Hong Kong's inbound tourism. Using network data of international visitors[28], this box evaluates the effect of the relative reopening status on visitor arrivals for a panel of economies and offers insights into the recovery of Hong Kong's inbound tourism.

Recent development in visitor arrivals

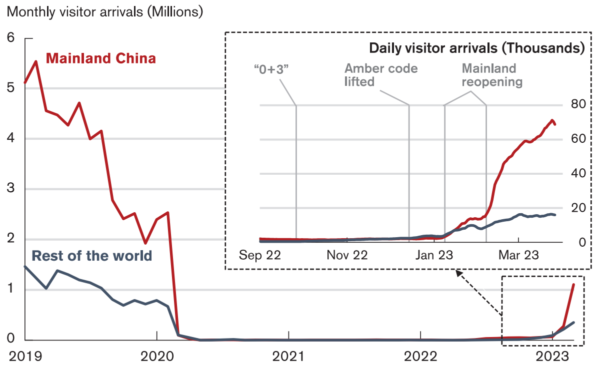
Before the pandemic, the peak visitor arrivals into Hong Kong were about 6.8 million (or about 219 thousand per day) in January 2019, and about 80% of them were from Mainland China (Chart B4.1). During the pandemic, visitor arrivals dropped to only several thousand per month amid stringent COVID-19 restrictions. With the restrictions being progressively relaxed since September 2022, visitor arrivals have picked up, especially after Mainland China's reopening since January 2023, although the number is still below the pre-pandemic level (Chart B4.2).

Chart B4.1
Share of visitor arrivals from Mainland China in 2019 by selected Asia-Pacific (APAC) economies



Sources: CEIC and HKMA staff calculation.

Chart B4.2
Visitor arrivals into Hong Kong



Note: Seven-day moving average for daily visitor arrivals.
Sources: C&SD and Immigration Department.

25 "0+3" refers to the lifting of compulsory quarantine requirements for inbound persons from overseas places or Taiwan starting from 26 September 2022. Inbound persons were subjected to three days of medical surveillance with Amber Code restrictions under the Vaccine Pass.

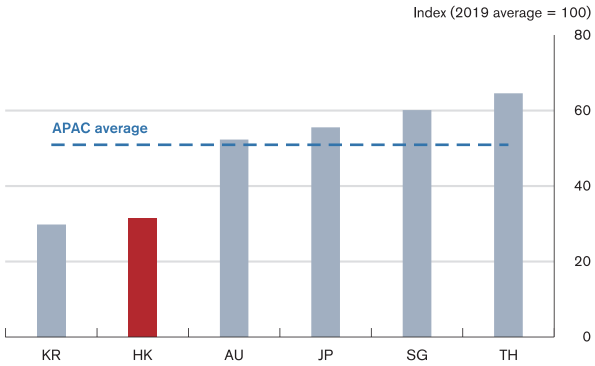
26 Amber code restrictions were further lifted on 14 December 2022, effectively removing most restrictions for international travellers.

27 The first-phase resumption of normal travel between Hong Kong and Mainland China started on 8 January 2023 and the full resumption commenced on 6 February 2023. The full resumption arrangements include opening up all boundary control points without imposing any prescribed daily numbers of people and cancelling the pre-departure nucleic acid test requirement. In addition, the requirement for non-Hong Kong residents to be fully vaccinated when coming to Hong Kong from overseas places was lifted on 6 February 2023.

28 The dataset comprises the number of visitors from one economy (departure) to another economy (arrival), instead of just the total visitor arrivals into a particular economy.

The recovery of visitor arrivals in Hong Kong was also lagging against other APAC destinations. For the ease of cross-economy comparison, we construct a Visitor Index which is defined as the number of visitor arrivals in each month as a percentage of monthly average in 2019 (i.e. as a percentage of the pre-pandemic level). The Visitor Index shows that visitor arrivals into Hong Kong recovered to about 31% of the pre-pandemic level in February 2023, this contrasts with many other APAC economies which recovered around 50% – 70% of visitor arrivals (Chart B4.3), in part, due to their earlier reopening.

Chart B4.3
Visitor Index of selected APAC economies



Note: Data as of Feb 2023 for HK, JP and SG, Jan 2023 for other economies.
Sources: CEIC and HKMA staff calculation.

Quantifying the reopening status

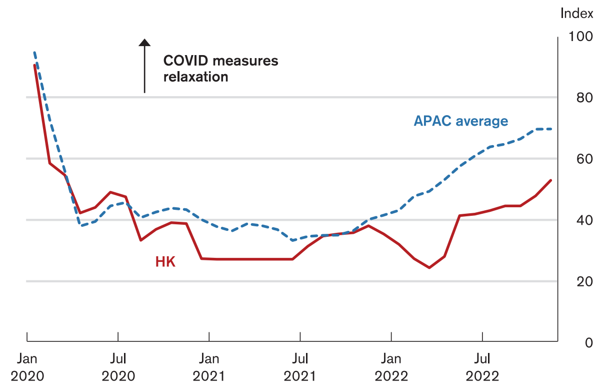
To understand the reopening status of different economies and facilitate comparison, we also compile a Relaxation Index based on the dataset developed by Hale et al. (2020)[29] on government responses to COVID-19. In particular, we combine indicators[30] that are more relevant to visitors' experience as reported in Table B4.1. The Relaxation Index ranges between 0 and 100, where 0 represents most restrictive and 100 represents completely relaxed. The Index suggests that Hong Kong's COVID-19 measures were tightening and largely in pace with the average APAC economies in 2020 and 2021 (Chart B4.4). However, when other APAC economies began to reopen in early 2022, Hong Kong had to again tighten its measures amid the fifth wave of the local epidemic, leading to the delayed reopening of Hong Kong. That said, the "reopening gap" between Hong Kong and other APAC economies is anticipated to close in 2023 alongside the rapid relaxation of COVID-19 measures in Hong Kong.

Table B4.1
Components of Relaxation Index

Government responses to COVID-19	Included in the Relaxation Index?
Schools closing	
Workplace closing	
Cancel public events	Yes
Restriction on gathering	Yes
Close public transport	Yes
Stay home requirement	Yes
Internal movement	Yes
International travel controls	Yes
Information campaign	
Testing policy	Yes
Contact tracing	Yes
Facial coverings	Yes

Sources: Hale et al. (2020) and HKMA staff.

Chart B4.4
Relaxation Index of Hong Kong and APAC economies



Source: Hale et al. (2020) and HKMA staff calculation.

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29 For more details, see Hale, Thomas, Noam Angrist, Beatriz Kira, Anna Petherick, Toby Phillips, and Samuel Webster. (2020) "Variation in government responses to COVID-19." Blavatnik School of Government, University of Oxford.

30 Indicators are combined using simple arithmetic average.

Empirical analysis and major findings

To study whether the delayed reopening of Hong Kong would cause any scarring effect on visitor arrivals, we model the network data on visitors involving 19 sample economies[31] and estimate the following panel data model:

$$\Delta VI_t^{D,A} = \beta Reopen_t^{D,A} + \gamma Ctrl_t^{D,A} + \alpha^{D,A} + \delta_t + e_t^{D,A} \quad (1)$$

where Δ is the two-month difference operator[32], $VI_t^{D,A}$ is the Visitor Index (as defined above) from departure economy D to arrival economy A in month t, $Reopen_t^{D,A}$ is a list of "reopening" variables, $Ctrl_t^{D,A}$ is a list of control variables, $\alpha^{D,A}$ is the departure-arrival economy pair fixed effect, δ_t is the time fixed effect and $e_t^{D,A}$ is the error term. For comparison and robustness check, we estimate equation (1) with two sample periods, one starting from 2021[33] focusing on the pandemic period and another from 2007 onwards.

Here we explain the three "reopening" variables in equation (1) which their coefficients are of particular interest in this analysis.

- The first is a dummy variable on whether the travel between economies D and A is non-restrictive, indicating the feasibility of hassle-free movements across economies. Specifically, if there are no quarantine requirements for both departure economy D and arrival economy A, the variable will be equal to one and the situation is conducive to visitor arrivals.

- The second is the Relaxation Index (as defined above) in arrival economy A. More relaxed COVID-19 restrictions are expected to bring in more visitors.

- The third is the relative reopening status, which gauges how advanced or delayed the reopening status of arrival economy A compared with its peers in the sample.[34] A more negative value means a more delayed reopening. To verify if the scarring effect of the delayed reopening exists, the relative reopening status is lagged by multiple periods in the estimations. These lagged terms could shed light on the persistence of the impact of delayed reopening.

Two categories of control variables are also incorporated in the estimations. The first category measures the risk of infection to visitors when traveling to arrival economy A, which includes the percentage increase in confirmed cases and the vaccination rate in that economy. The second category is the conventional economic factors affecting inbound tourism, which include the percentage change of the FX cross rate (a positive number represents an exchange rate appreciation of economy A against economy D) to measure price competitiveness, the year-on-year percentage change in airfare to partially capture post-pandemic supply-side constraints on international travel and the GDP growth of departure economy D.

Table B4.2 reports the estimation results, which confirms that all estimated parameters of interest are of the right signs. More importantly, the non-restrictive travel between two economies and the relaxation of COVID-19 measures are significant in resuming visitor arrivals. In addition, the effects of the relative reopening

31 There are some missing economy pairs due to the unavailability of monthly data breakdown. However, our sample should be able to capture a majority of travelling routes in the region.

32 We have also used one-month difference and the results are similar.

33 Instead of the year 2020, we use 2021 when global travel stayed subdued in order to circumvent the potential distortion due to the abrupt slump in visitors in 2020.

34 Technically, it is defined as the z-score: The Relaxation Index of arrival economy A minus the average Relaxation Index of the sample economies and then the whole term divided by the standard deviation of the Relaxation Index of the sample economies.

status are significant up to three months but not beyond that, suggesting that the adverse impact of Hong Kong's delayed reopening is transitory. Additional analysis also ascertains that the magnitude of the dragging effect from a delayed reopening is small compared with the boosting effect of non-restrictive travel. Hence, the adverse effect of Hong Kong's delayed reopening is expected to be limited.

Furthermore, while the conventional economic factors (i.e. FX cross rate and airfare) are significant over the longer horizon, they do not have material impact during the pandemic. This result is intuitive as the number of visitor arrivals during the pandemic was essentially driven by policies (e.g. lockdowns), while the impact of other economic factors is expected to become more consequential only when international travel returns to normal.

Table B4.2
Estimation results

Dependent variable: $\Delta VI_t^{D,A}$	Since 2021	Since 2007
Reopening variables		
Non-restrictive travel between D and A (True = 1)	+	+
Δ Relaxation Index of A	+	+
Relative reopening status of A:		
lagged for 2 months	+	+
lagged for 3 months	+	
lagged for 4 months		
lagged for 5 months		
Control variables		
%Δ Confirmed cases in A	–	
%Δ FX rate (Positive = relative appreciation in A)		–
Airfare (%yoy)		–

Note: + / – denote positive/negative coefficients at the 10% significance level using robust standard error. Other insignificant variables, including vaccination rate and GDP growth, are not shown.

Source: HKMA staff estimates.

Implications for Hong Kong and concluding remarks

Previously, there was a concern that the delayed reopening of Hong Kong might have caused a scarring effect on Hong Kong's inbound tourism. Our estimation results suggest that the adverse effect of such a delayed reopening, although exists, is expected to have only a transitory and limited impact on Hong Kong's inbound tourism. Thus, as Hong Kong relaxes its COVID-19 measures and Mainland China reopens, the path of Hong Kong's visitor revival is expected to converge with other APAC destinations over time. In particular, Hong Kong is even likely to capture the greatest benefit from Mainland China's reopening, as Hong Kong's share of visitor arrivals from Mainland China was much higher than other economies before the pandemic.

However, the pace of recovery of inbound tourists into Hong Kong remains highly uncertain. While there has been a visible rise in tourist arrivals lately, the recent supply-side constraints, which has been partially reflected in the elevated airfare, may pose headwinds. From a broader perspective, as Hong Kong's economic growth for 2023 will significantly hinge on the pace of recovery of inbound tourists, a much faster-than-expected revival represents a major upside risk to GDP growth this year. In tandem, the limited impact of Hong Kong's delayed reopening may also bode well for local labour market conditions, which helps alleviate concerns about the potential scarring effect on the labour market (e.g. unemployment rate) due to the pandemic.

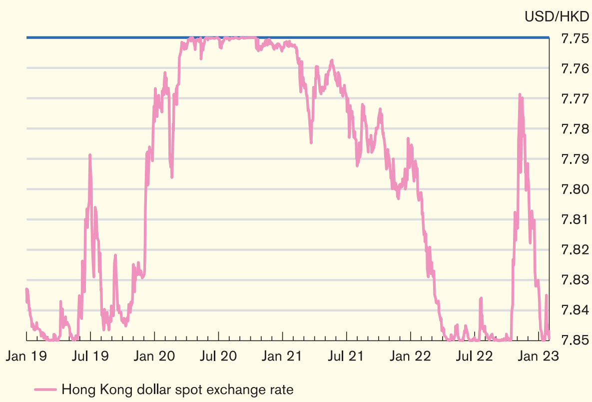
4. Monetary and financial conditions

The Hong Kong dollar stayed close to the weak-side CU from September to early November 2022, before regaining some strength towards the end of 2022 amid stronger local equity market activities and year-end funding demand. HIBORs increased gradually from September to December 2022 along with higher US dollar interest rates. Moving into 2023, as the effect from seasonal demand for Hong Kong dollar funding faded, the Hong Kong dollar exchange rate softened to close to the weak-side CU again and HIBORs receded. With total deposits increasing modestly in the seven months since end-June 2022, there was no notable sign of outflows from the Hong Kong banking system. Overall, the Hong Kong dollar exchange and money markets continued to trade in a smooth and orderly manner. Looking ahead, uncertainties related to US monetary policy, the growth outlook for the major AEs, and lingering geopolitical tensions may heighten fund-flow volatility. Nonetheless, with the ample foreign reserves position and a robust financial system, Hong Kong is able to withstand the volatilities in fund flows without compromising its financial stability.

4.1 Exchange rate and capital flows

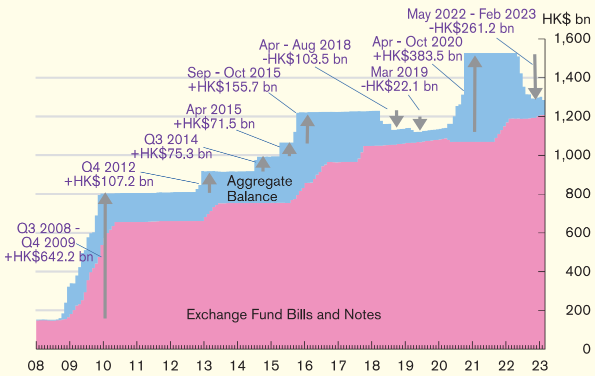
The Hong Kong dollar stayed close to the weak-side CU from September to early November 2022, driven by the local stock market correction, market expectation of further US interest rate hikes, and continued carry trade activities, with the weak-side CU being triggered 10 times during the period. Amid stronger local equity market activities and year-end funding demand, the Hong Kong dollar regained some strength from mid-November to end-2022, but softened at the beginning of 2023 as the seasonal demand for Hong Kong dollar funding faded. On 13 and 14 February 2023, the weak-side CU was triggered 2 more times. During the review period, the Hong Kong dollar traded within a range between 7.7687 and 7.8500 against the US dollar (Chart 4.1). From the first weak-side CU triggering in May 2022 to February 2023, the weak-side CU was triggered 43 times in total. As a result, the HKMA purchased a total of HK$261.2 billion at the request of banks in accordance with the design of the LERS. The Aggregate Balance of the banking system declined from HK$337.5 billion at the end of April 2022 to HK$77.1 billion at the end of February 2023 (Chart 4.2).

Chart 4.1
Hong Kong dollar exchange rate



Source: HKMA.

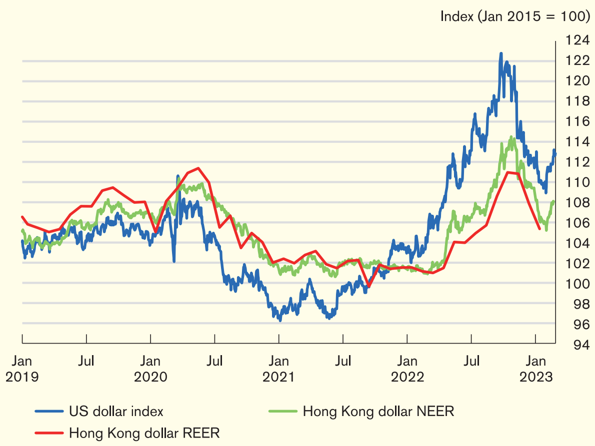
Chart 4.2
Aggregate Balance and Exchange Fund Bills and Notes (EFBNs)



Source: HKMA.

Broadly tracking the movements of the US dollar, the Hong Kong dollar nominal effective exchange rate index (NEER) weakened during the review period (Chart 4.3). The Hong Kong dollar real effective exchange rate index (REER) generally followed the movement of the NEER.

Chart 4.3
NEER and REER



Note: The REER is seasonally adjusted and available only on a monthly basis.
Sources: CEIC, C&SD and HKMA staff estimates.

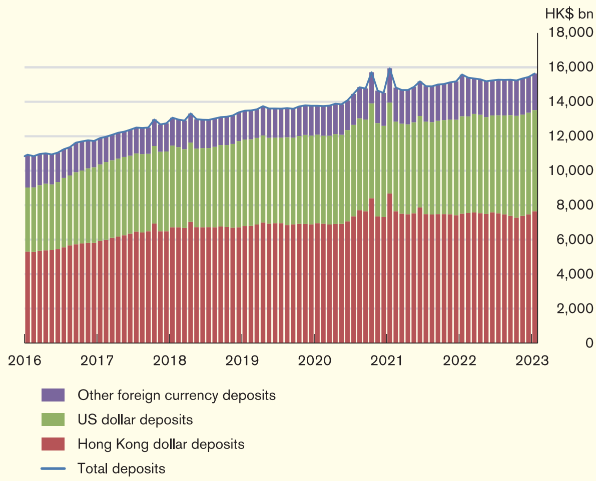
Looking ahead, uncertainties related to US monetary policy, the growth outlook for the major AEs, and lingering geopolitical tensions may heighten fund-flow volatility. However, with the ample foreign reserves position and a robust financial system, Hong Kong is able to withstand the volatilities in fund flows without compromising its financial stability.

4.2 Monetary environment and interest rates

Despite the triggering of the weak-side CU and the ongoing US monetary policy tightening during the review period, the Hong Kong dollar Monetary Base remained sizeable and broadly stable, at HK$1,896.4 billion as at the end of February 2023.

In the seven-month period since end-June 2022, total deposits with AIs increased modestly by 2.6%, with Hong Kong dollar deposits increasing by 0.9% and foreign currency deposits increasing by 4.4% (Chart 4.4). It should be noted that monetary statistics are subject to volatility due to a wide range of transient factors, such as seasonal and initial public offering (IPO) related funding demand as well as business and investment-related activities. It is therefore more appropriate to observe the longer-term trends. For 2022 as a whole, total deposits and Hong Kong dollar deposits increased by 1.7% and 0.7% respectively. There was no notable sign of outflows from the Hong Kong banking system.

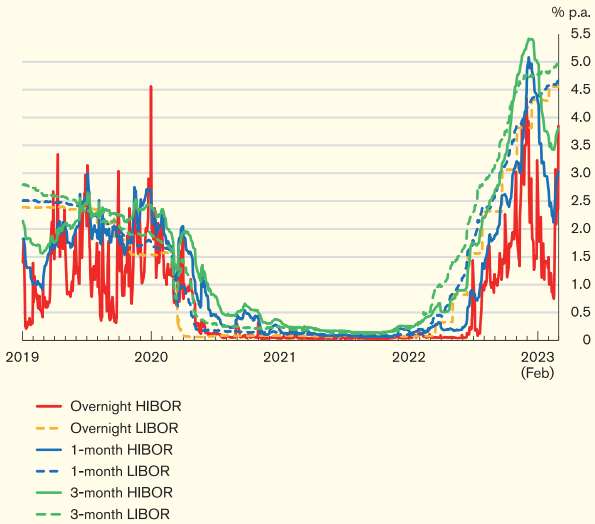
Chart 4.4
Deposits with AIs by currency



Source: HKMA.

Overall, Hong Kong's interbank market continued to trade in a smooth and orderly manner. Under the LERS, the Hong Kong dollar interbank rates generally track their US dollar counterparts. Alongside US rate hikes, HIBORs gradually increased from September to December 2022 (Chart 4.5). Driven by stronger local equity market activities, seasonal year-end funding demand, and an expectation of further US rate hikes, the one-month HIBOR once rose above 5% in early December 2022. Moving into 2023, HIBORs receded as the seasonal demand for Hong Kong dollar funding faded. The one-month HIBOR declined to an average of 2.5% in February.

Chart 4.5
Hong Kong dollar and US dollar interbank interest rates



Sources: CEIC and HKMA.

On the retail front, following US policy rate hikes, many banks raised their Best Lending Rates three times or by 62.5 basis points in total from September to December 2022. Specifically, they raised the Best Lending Rates by 12.5 basis points in late September 2022, 25 basis points in early November 2022, and another 25 basis points in mid-December 2022. At the end of the review period, the Best Lending Rates in the market ranged from 5.625% to 6.125%. Meanwhile, some major banks further increased the cap on HIBOR-based mortgage rates of newly approved mortgage loans in late November and December 2022. Accordingly, the average lending rate for new mortgages increased further from 2.31% in July 2022 to 3.50% in January 2023.

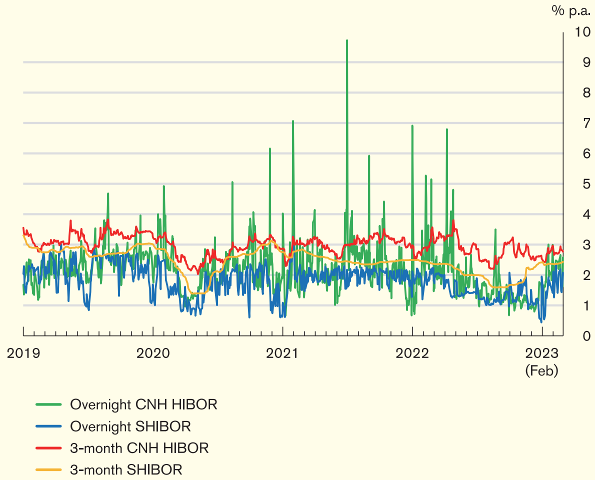
Going forward, movements in Hong Kong dollar interest rates will continue to be influenced by their US counterparts under the design of the LERS, and the Hong Kong dollar interbank rates might remain at elevated levels for some time. Meanwhile, there will continue to be considerable uncertainties on the interest rate path in the US. However, sufficient liquidity in the banking system in Hong Kong should provide a sizeable cushion in the event of financial market volatility.

Offshore renminbi banking business

Liquidity conditions in the CNH interbank market remained stable during the review period,[35] and the three-month CNH HIBOR continued to hover around 3%. While the overnight CNH HIBOR witnessed brief fluctuations in late August 2022 arising from occasional funding needs for foreign exchange settlement, it mostly traded below 2% (Chart 4.6).

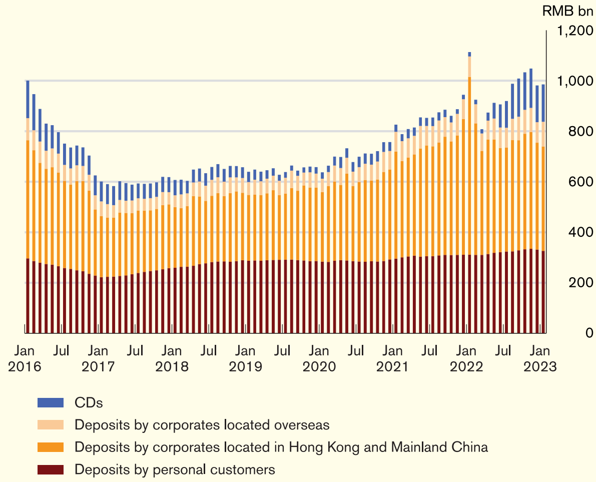
[35] See Chapter 2.2 for the development of offshore and onshore renminbi exchange rates.

Chart 4.6
The overnight and the three-month CNH HIBOR fixings



Source: CEIC.

Chart 4.7
Renminbi customer deposits and CDs in Hong Kong



Source: HKMA.

Following consolidation in the first half of 2022, Hong Kong's CNH liquidity pool expanded during the review period. The total outstanding amount of renminbi customer deposits and certificates of deposit (CDs) reverted to a 7.1% increase in the six-month period since the end of July 2022 to RMB985.6 billion at the end of January 2023 (Chart 4.7 and Table 4.A). Among the total, renminbi customer deposits grew by 2.9% during this period, mainly led by growth in corporate customer deposits. Meanwhile, with the continued increase in the issuance of renminbi CDs, outstanding CDs expanded by 39.6% during the same period.

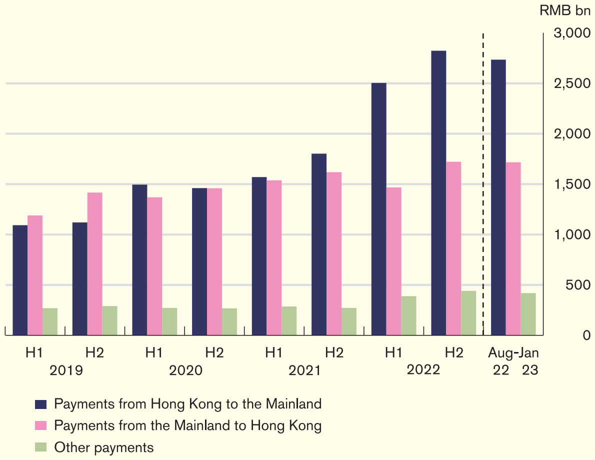
Table 4.A
Offshore renminbi banking statistics

	Dec 2021	Jan 2023
Renminbi deposits & CDs (RMB bn)	944.7	985.6
Of which:		
Renminbi deposits (RMB bn)	926.8	837.3
Share of renminbi deposits in total deposits (%)	7.5	6.2
Renminbi CDs (RMB bn)	17.9	148.3
Renminbi outstanding loans (RMB bn)	163.6	220.8
Number of participating banks in Hong Kong's renminbi clearing platform	212	211
Amount due to overseas banks (RMB bn)	102.9	139.4
Amount due from overseas banks (RMB bn)	100.4	126.7
	2021	**2022**
Renminbi trade settlement in Hong Kong (RMB bn)	7,083.6	9,342.1
Of which:		
Inward remittances to Hong Kong (RMB bn)	3,154.6	3,188.5
Outward remittances to Mainland China (RMB bn)	3,371.3	5,324.1
Turnover in Hong Kong's RMB real time gross settlement (RTGS) system (Daily average during the period; RMB bn)	1,522.6	1,654.0

Source: HKMA.

For other renminbi business, the outstanding amount of renminbi loans expanded by 28.0% in the six-month period since July 2022. Hong Kong's renminbi trade settlement also continued to pick up. Transactions handled by banks in Hong Kong amounted to RMB4,867.4 billion for the period between end-July 2022 and end-January 2023 (Chart 4.8), up by 29.3% compared with RMB3,763.0 billion during the same period last year. The deep renminbi liquidity pool in Hong Kong continued to support a large amount of renminbi payments and financing transactions. For 2022 as a whole, the average daily turnover of the renminbi RTGS system rose to RMB1,654.0 billion from RMB1,522.6 billion recorded in 2021.

Chart 4.8
Flows of renminbi trade settlement payments



Source: HKMA.

Looking ahead, the continuing development of Hong Kong's offshore renminbi ecosystem will further reinforce its leading role in offshore renminbi business. The enhanced Currency Swap Agreement with the PBoC, as well as the enhancements to the HKMA's renminbi liquidity facility, will ensure the availability of ample renminbi liquidity in Hong Kong as an offshore renminbi market. At the same time, the continuous efforts in strengthening connectivity with the Mainland through various schemes, including the Swap Connect, the two-way Stock, Bond, and Cross-boundary Wealth Management Connects, will provide a more diverse range of renminbi-denominated products in Hong Kong. In relation to financial infrastructure, the planned upgrading of the CMU into a major ICSD in Asia will also add to a robust and secure channel for overseas investors to efficiently trade renminbi assets. With these initiatives, Hong Kong will be in a position to capture further opportunities brought by the continuing liberalisation of Mainland's capital account and the deepening regional economic and financial co-operation under the Belt and Road and the Guangdong-Hong Kong-Macao Greater Bay Area initiatives.

Asset markets

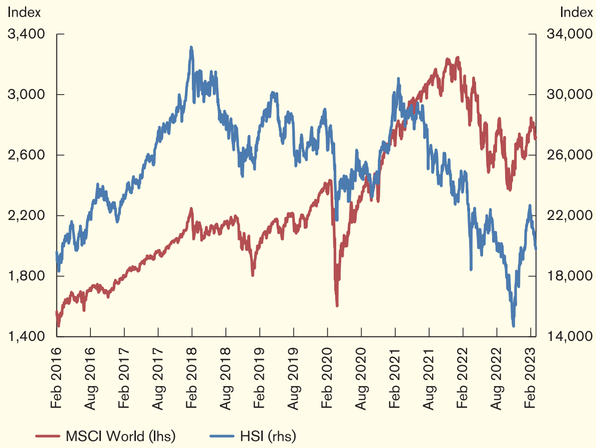
Amid monetary tightening by major central banks, the Hong Kong equity market underwent a sharp correction in September and October 2022. The local equity market rebounded afterwards, led by the prospects of a slowdown in US interest rate hikes and re-opening of the Mainland and Hong Kong economies, before declining in February 2023. Despite the rising interest rates, the Hong Kong debt market continued to grow in 2022. The residential property market softened further in the second half of 2022 amid an uptick in mortgage rates and weak economic activities, before showing signs of stabilisation in early 2023.

4.3 Equity market

Global equity markets took a roller coaster ride during the review period. Amid monetary tightening by major central banks, global equity prices underwent a sharp correction in September and October 2022 (Chart 4.9). In Hong Kong, the weak market sentiment pushed down the Hang Seng Index even further, dropping to a thirteen and a half-year low of 14,687 points on 31 October. The local equity market rebounded afterwards, led by the prospects of a slowdown in US interest rate hikes and re-opening of the Mainland and Hong Kong economies, before declining in February 2023. Overall, the Hang Sang Index declined slightly by 0.8% from the end of August 2022 to the end of February 2023, while the MSCI World Index registered a 3.3% increase in the same period.

Volatilities in equity markets displayed a similar trend. Measured by the option-implied volatilities of the S&P 500 Index and the Hang Seng index, equity market volatilities first eased considerably from their recent peaks in October 2022, before moving up towards the end of the review period (Chart 4.10). The SKEW Index increased at the same time, suggesting that investors were willing to pay more for downside protection amid volatile market condition.[36]

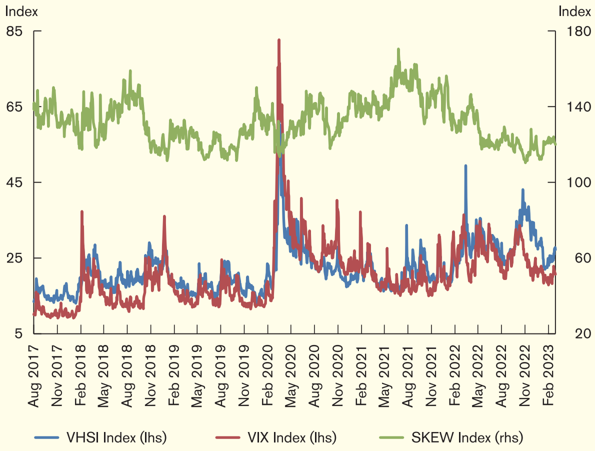
Chart 4.9
The Hang Seng Index and The MSCI World Index



Source: Bloomberg.

[36] The SKEW Index is calculated by the Chicago Board Options Exchange from the prices of the S&P 500 out-of-the-money options. A SKEW value of 100 means that the probability of outlier negative returns on a 30-day horizon is negligible. As the SKEW rises above 100, the left tail of the S&P 500 returns distribution acquires more weight, suggesting that the probability of outlier negative returns has become more significant. For details, see https://www.cboe.com/products/vix-index-volatility/volatility-indicators/skew.

Chart 4.10
Option-implied volatilities of the Hang Seng Index and the S&P 500 Index, and the SKEW Index

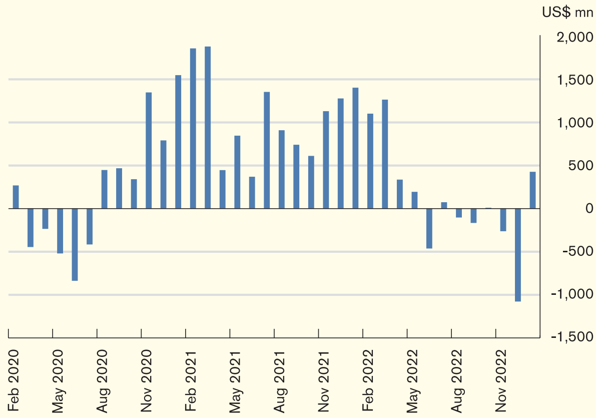


Source: Bloomberg.

In tandem with the outflows from equity market funds globally, equity market funds registered net outflows from Hong Kong between August 2022 and January 2023 (Chart 4.11), suggesting that international investors have stayed cautious with equity investments amid tightened monetary conditions.

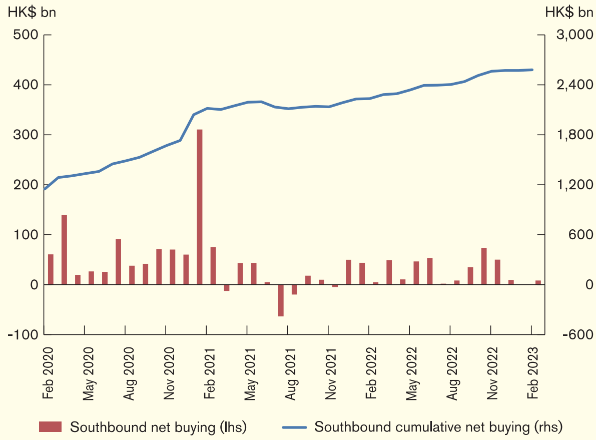
By contrast, Mainland investors remain keen on investing in the Hong Kong equity market, with the southbound Stock Connect registering a net inflow of HK$176.8 billion between the end of August 2022 and the end of February 2023. During the review period, the cumulative net buying amount increased by 7.4% to HK$2,580.4 billion (Chart 4.12).

Chart 4.11
Equity market fund flows into Hong Kong



Source: EPFR Global.

Chart 4.12
Net buying through southbound Stock Connect over time

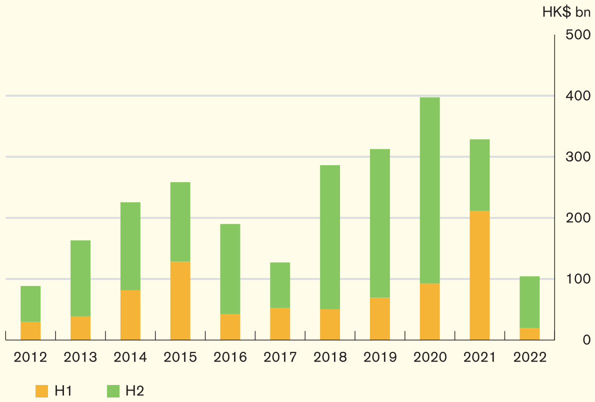


Note: Southbound net buying is the sum of such buying on the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect.

Sources: CEIC and HKMA staff estimates.

The initial public offering (IPO) activities in Hong Kong rebounded in the second half of 2022. The amount raised through IPO in the second half of 2022 increased three times compared with the first half, due partly to a low-base effect (Chart 4.13). The resurgence of Hong Kong's IPO activities is expected to continue in 2023 with improvement in market sentiment, as well as the introduction of a new listing regime that will promote the listing of Specialist Technology Companies (STCs).[37]

Chart 4.13
Initial public offering market in Hong Kong



Source: HKEX.

The near-term outlook of local equity market will be subjected to a number of factors. On the one hand, higher for longer interest rates and significant growth slowdown in AEs, if materialised, can hurt financial performance of corporates, while lingering geopolitical tensions such as the Russia-Ukraine conflict will continue to weigh on market sentiment. On the other hand, the rapid re-opening of the Mainland economy may help boost the prospects of the Hong Kong equity market.

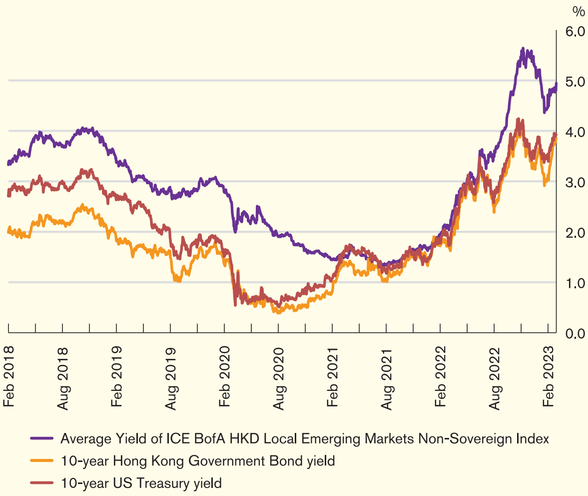
4.4 Debt market[38]

Along with the monetary tightening in the US, the yields of US 10-year Treasury and Hong Kong dollar 10-year Government Bond surged and reached above 4% in late October 2022 (Chart 4.14). The yields eased afterwards, before going up in February 2023. The yield of Hong Kong dollar corporate bonds rose at an even faster pace and remained at an elevated level. The rising bond yields have dampened investor appetite, as reflected by net outflows from Hong Kong by bond market funds between August 2022 and January 2023 (Chart 4.15).

[37] In October 2022 the Hong Kong Exchanges and Clearing Limited (HKEX) issued a consultation paper on new listing regime for STCs, which proposes to lower the bar for STCs with high growth potential to list on the HKEX. STCs are companies primarily engaged in research, development, and commercialisation and/or sales of products and/or services that apply science and/or technology within an acceptable sector of a Specialist Technology Industry (for example, advanced hardware, next energy and environmental protection, and etc). The proposed new listing regime will be introduced on 31 March 2023.

[38] Debt securities statistics reported in this section include bills, bonds, notes, negotiable certificates of deposit, commercial paper, debentures, asset-backed securities, and similar instruments normally traded in the financial markets that serve as evidence of a debt.

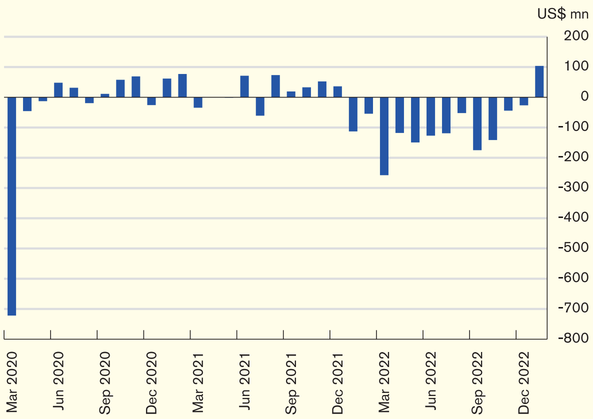
Chart 4.14
Yields of 10 year US Treasury, 10-year Hong Kong Government Bond, and Hong Kong dollar corporate bonds



Note: The ICE BofA HKD Local Emerging Market Non-Sovereign Index, which covers Hong Kong dollar bonds issued by corporates and quasi government entities, captures the movement in yields of Hong Kong dollar corporate bonds.

Sources: ICE Data Indices, Bloomberg and HKMA.

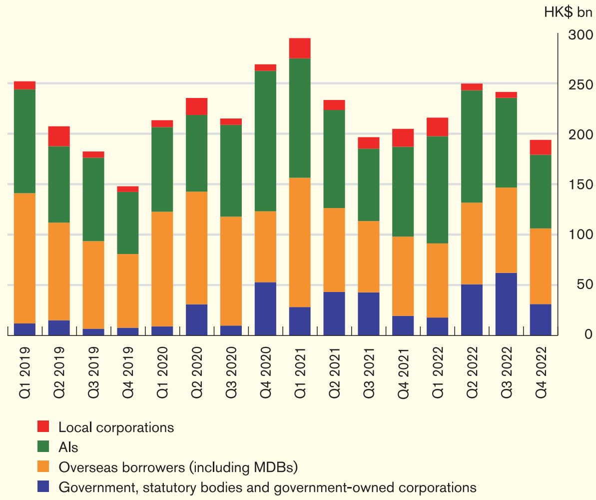
Chart 4.15
Bond market fund flows into Hong Kong



Source: EPFR Global.

Despite the rising bond yields, the total issuance of Hong Kong dollar debt increased by 8.9% to HK$4,720.4 billion in 2022, from the preceding year. The growth is supported by a rise in local public sector issuance, which more than offsets the decline in issuance by local corporations and overseas borrowers (Chart 4.16).

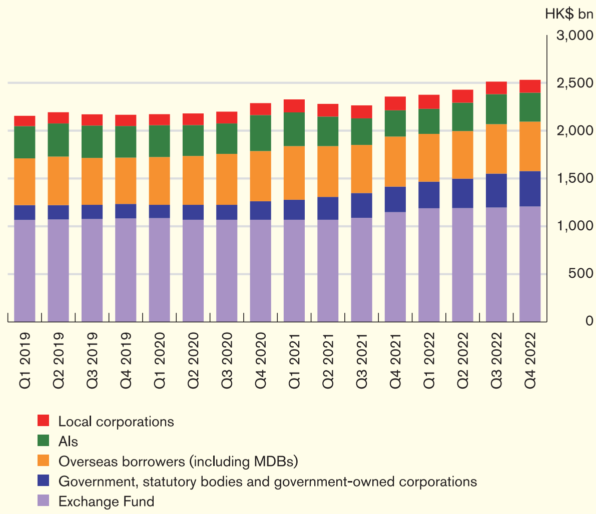
Chart 4.16
New issuance of non-EFBN Hong Kong dollar debt



Source: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

As a result, the outstanding amount of Hong Kong dollar debt at the end of 2022 rose by 7.4% year-on-year to HK$2,531.9 billion (Chart 4.17). The amount was equivalent to 31.2% of Hong Kong dollar M3, and to 25.0% of the Hong Kong dollar-denominated assets of the banking sector. Within the local public sector, outstanding non-EFBN debt rose sharply by 38.7% year-on-year to HK$369.2 billion, while outstanding EFBN debt grew by 5.1% to HK$1,207.5 billion.

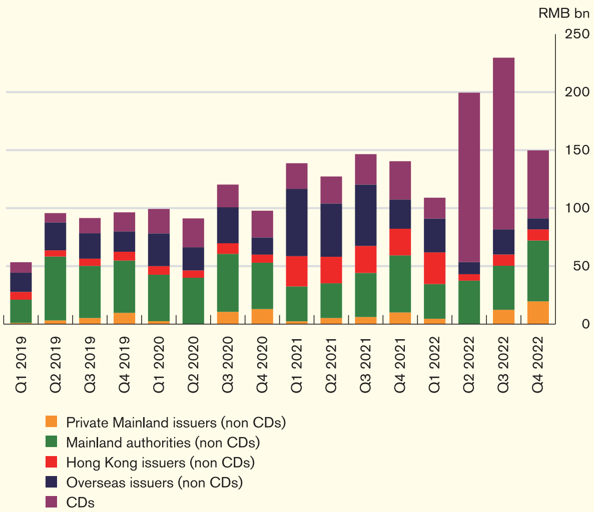
Chart 4.17
Outstanding Hong Kong dollar debt by issuer



Source: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

The CNH debt market in Hong Kong also grew in 2022. The total new issuance in 2022 increased by 24.4% to RMB688.0 billion compared with preceding year. The growth was mainly contributed by a sharp rise in issuance of CNH CDs, which increased 2.5 times to RMB370.8 billion in 2022 from the preceding year. This more than offsets the reduction in non-CDs CNH debt issuance (Chart 4.18). As a result, the total outstanding amount of CNH debt securities saw a 40.2% year-on-year increase to RMB 949.3 billion at the end of 2022 (Chart 4.19).

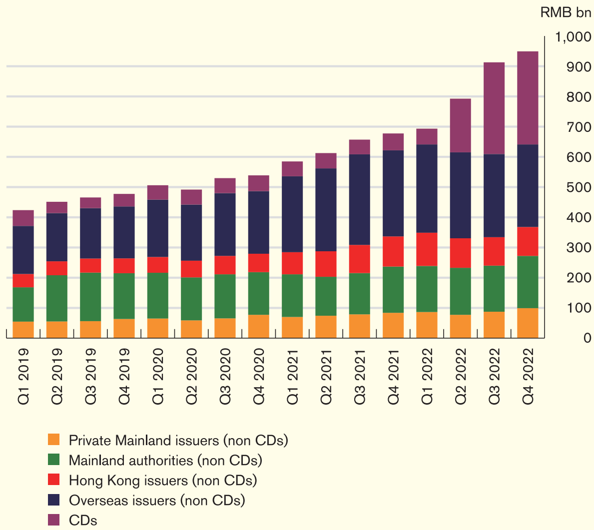
Chart 4.18
New issuance of CNH debt securities in Hong Kong



Note: The classification of CDs/non-CDs CNH debt securities is based on information from source.

Sources: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

Chart 4.19
Outstanding CNH debt securities issued in Hong Kong



Note: The classification of CDs/non-CDs CNH debt securities is based on information from source.

Sources: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

The near-term outlook of the Hong Kong debt market hinges on a host of factors. For instance, corporates may hold back debt issuance amid the rising debt financing cost and risks of significant growth slowdown in advanced economies, while policy supports to the Mainland economy could help lift the demand for CNH debt securities.

During the review period, the local debt market continued to attract Mainland entities to issue offshore renminbi bond. For instance, the People's Government of Hainan Province and the Shenzhen Municipal People's Government each issued RMB 5 billion worth of CNH bonds in Hong Kong in November 2022. The issuance by the People's Government of Hainan Province is the first CNH bond issuance in Hong Kong by a Chinese provincial government.

In addition, in promoting green and sustainable bonds in Hong Kong, on 5 January 2023, the Hong Kong Government announced the successful offering of US $5.75 billion worth of green bonds, denominated in US dollar, euro and renminbi, under the Government Green Bond Programme. This triple-currency offering, which was the largest environmental, social and governance (ESG) bond offering in Asia, has attracted participation from a diverse group of conventional and green investors. Besides, on 16 February 2023, the Hong Kong Government announced the successful offering of HK$800 million of tokenised green bond under the Government Green Bond Programme, the first tokenised green bond issued by a government globally.

Together, these issuances have strengthened Hong Kong's status as a global offshore renminbi centre, and a premier green and sustainable finance hub in Asia.

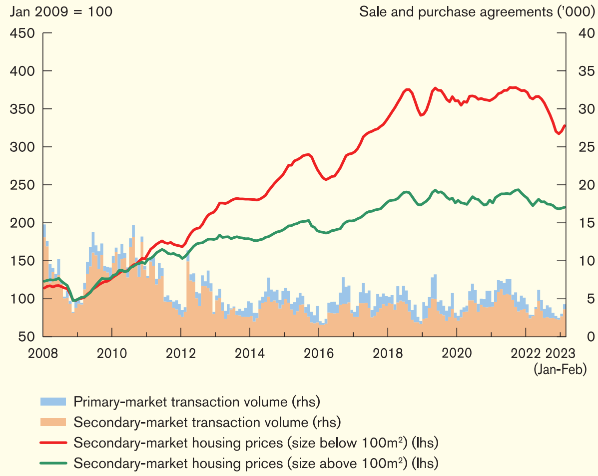
4.5 Property markets

Residential property market

The residential property market was under pressure in the second half of 2022 amid tightened financial conditions and weak economic activities. The viewing of flats and transaction activities moderated, while the sales momentum of new launches by developers also declined. Average monthly transactions fell successively to 3,894 units in the third quarter and 2,795 units in the fourth quarter. Together with a generally quiet first half due partly to the local epidemic, the total transaction volume dropped to 45,050 units in 2022, down 39% from 2021 and becoming the lowest level on record (Chart 4.20).

Secondary-market housing prices also softened in the second half of 2022, as market sentiment deteriorated and more home sellers were willing to cut their asking prices. Analysed by size, the price for small and medium-sized flats (with a saleable area of less than $100m^2$) saw a sharper decline than for large flats (with a saleable area of at least $100m^2$) (Chart 4.20). For 2022 as a whole, residential property prices recorded an orderly adjustment of 15%.

Chart 4.20
Residential property prices and transaction volumes

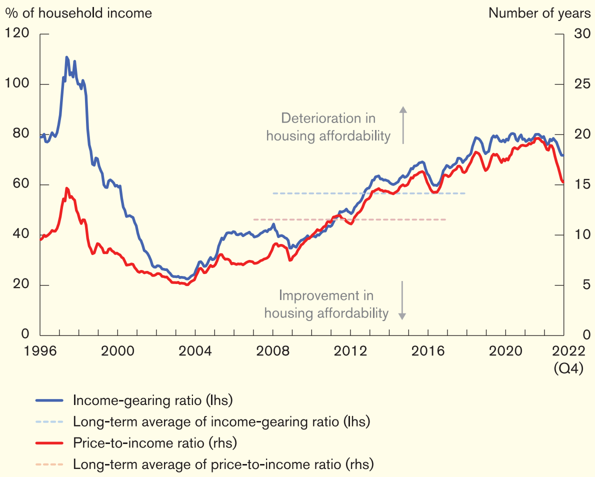


Sources: R&VD and Land Registry.

Moving into 2023, the housing market showed signs of stabilisation as market sentiment revived alongside the resumption of travel between Mainland China and Hong Kong. Transaction volume picked up in January and February, and the Centa-City Leading Index of housing prices increased by about 5% during the same period.

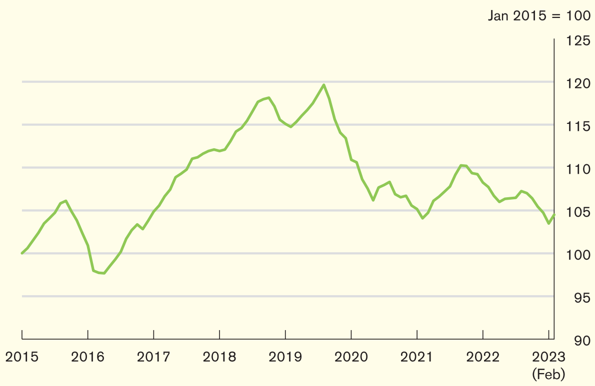
Housing affordability remained stretched, despite some signs of improvement in the second half of 2022. Mainly reflecting the downward adjustment of housing prices, the housing price-to-income ratio moderated to 15.6 in the fourth quarter, slightly higher than the peak value of about 15 in 1997. The income-gearing ratio also eased to 72.3%, still well above the long-term average, with the effect of lower flat prices partly offset by the impact of higher mortgage rates (Chart 4.21).[39] In the leasing market, housing rentals generally eased in the second half of 2022 and early 2023 (Chart 4.22). Residential rental yields stayed low at 2.5% in January 2023.

Chart 4.21
Indicators of housing affordability



Sources: R&VD, C&SD and HKMA staff estimates.

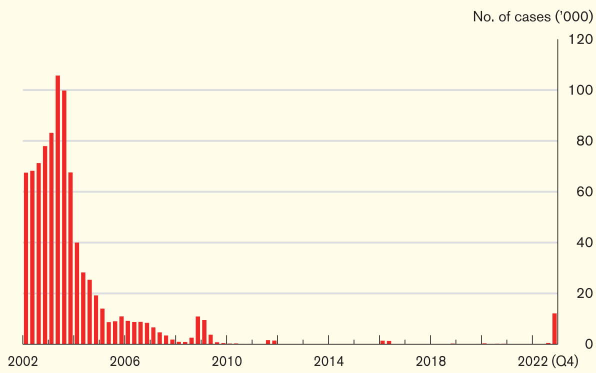
Chart 4.22
Residential property rental index



Source: R&VD.

Following the US Fed's successive policy rate hikes, major banks have raised their Best Lending Rates and the interest rate cap of their HIBOR-based mortgage plans since September 2022, putting an additional burden on borrowers' mortgage repayments (see also section 4.2). The estimated number of residential mortgage loans (RMLs) in negative equity increased to 12,164 cases at end-December 2022 as housing prices softened (Chart 4.23). These cases were related to bank staff housing loans or RMLs under the Mortgage Insurance Programme (MIP), which generally have a higher LTV ratio. It should be noted that the MIP has strict requirements on the applicant's repayment ability. In fact, the delinquency ratio of RMLs under the MIP was 0.01% at end-December 2022, which is even lower than the 0.06% delinquency ratio of RMLs for the whole banking sector, suggesting the loan quality under the MIP is very high. Looking ahead, the continued recovery of the labour market is expected to help households meet their mortgage obligation and thus contain any upward pressures on the delinquency ratio of RMLs. As such, the risks relating to banks' RMLs are considered to be manageable.

Chart 4.23
Residential mortgage loans in negative equity



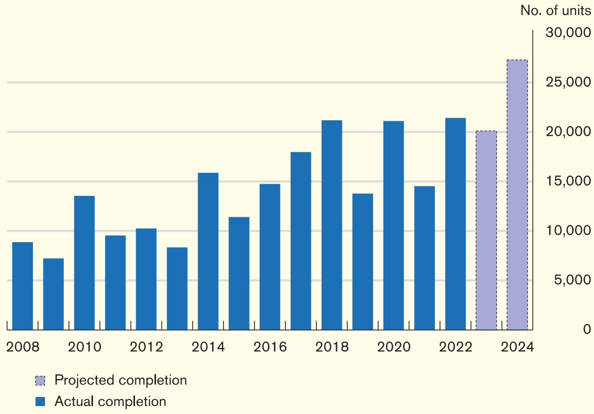
Source: HKMA.

[39] The price-to-income ratio measures the average price of a typical 50m² flat relative to the median income of households living in private housing. Alternately, the income-gearing ratio compares mortgage payment for a typical 50m² flat (under a 20-year mortgage scheme with a 70% loan-to-value ratio) to the median income of households living in private housing. The income-gearing ratio is not the same as a borrower's actual debt-servicing ratio, which is subject to a maximum cap under HKMA prudential measures.

More broadly, the macro-prudential measures introduced by the HKMA since 2009 have helped contain household leverage and strengthen banks' risk management for mortgage loans, thereby improving their resilience to interest rate and property market shocks. The average loan-to-value ratio for new mortgages was about 59% in January 2023, below the prevailing ratio of 64% before the measures were first introduced. The debt-servicing ratio also stayed low at around 39% and borrowers are stress-tested to ensure their ability to withstand rising interest rates. Indeed, over half of the private housing units did not have any outstanding mortgages at the end of 2022. However, the public should be prepared for the likelihood that banks' lending rates may increase further, and should carefully assess and manage the relevant risks when making property purchases and mortgage decisions.

The residential property market outlook is subject to a number of uncertainties and risks as discussed in previous chapters. In particular, higher mortgage interest rates and greater short-term private housing supply[40] may continue to cloud the housing market outlook, while the normalisation of cross-boundary travel between Mainland China and Hong Kong may release pent-up demand and revitalise market sentiment. Over the longer term, the outlook for the housing market will depend on the supply-demand gap. The Government projects that private housing supply will remain high in the coming years (Chart 4.24).[41]

Chart 4.24
Private flat completion

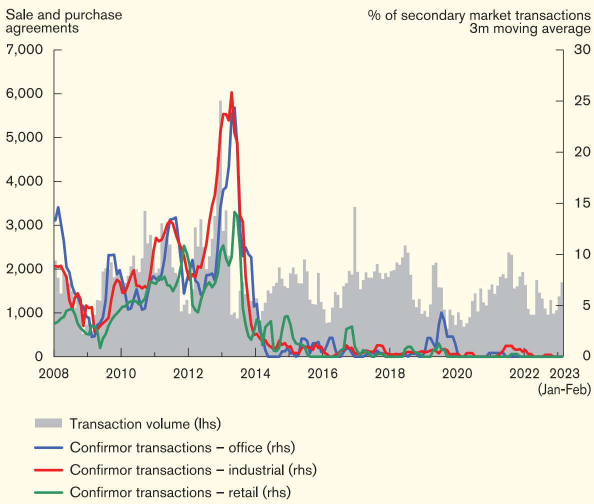


Source: R&VD.

Non-residential property market

The non-residential property market turned more sluggish in the second half of 2022. Average monthly transactions decreased to 1,120 units during the period, while speculative activities remained small (Chart 4.25). Partly reflecting the interest rate hikes, the prices for office space, retail premises and flatted factories retreated (Chart 4.26). In the leasing market, rentals for commercial properties also generally stayed soft along with weakening economic activities (Chart 4.27). Rental yields across the segments remained at a low range of 2.7–3.1% in January 2023.

Chart 4.25
Transactions in non-residential properties

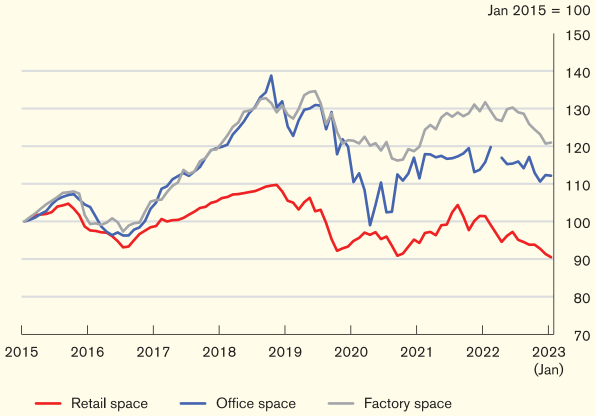


Sources: Land Registry and Centaline Property Agency Limited.

40 Data from the Housing Bureau indicate that unsold units of completed projects were at a recent high of 16,000 at the end of 2022.

41 In addition, total private first-hand flat supply in the coming three to four years is expected to rise to a record high of 105,000 units as estimated by the Housing Bureau at end-2022.

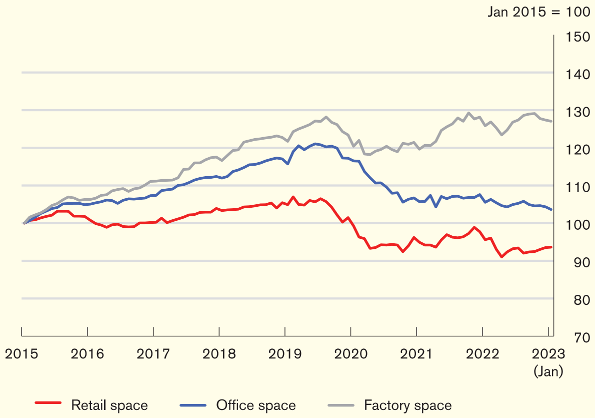
Chart 4.26
Non-residential property price indices



Note: The price index of office space cannot be compiled in March 2022 due to insufficient data for analysis.

Source: R&VD.

Chart 4.27
Non-residential property rental indices



Source: R&VD.

The outlook for the non-residential property market will hinge on a number of counteracting factors. For instance, the reopening of Mainland China and Hong Kong is expected to drive the recovery of inbound tourism and therefore provide some support to the retail segment. On the other hand, the prevailing high vacancy rate, coupled with more new supply in the near term, may continue to weigh on the rental and capital values of commercial properties.

5. Banking sector performance

Retail banks' profit improved in the second half of 2022 compared with the same period in 2021 mainly due to higher net interest income. Reflecting upward pressure on Hong Kong dollar interbank rates and retail deposit rates amid US interest rate hikes, the overall Hong Kong dollar funding costs for retail banks increased notably in the second half of 2022. The classified loan ratio increased during the review period, but remained at a healthy level. Overall, the Hong Kong banking sector remained resilient, underpinned by sound and robust capital and liquidity positions. Looking ahead, while the relaxation of COVID-19 restrictions should brighten the outlook for the Hong Kong economy, uncertainties related to future US interest rate adjustments, the growth outlook for major advanced economies, and the lingering geopolitical risks will pose challenges to the banking sector. Banks should stay vigilant against the impacts of these risk factors on the asset quality of their loan portfolios.

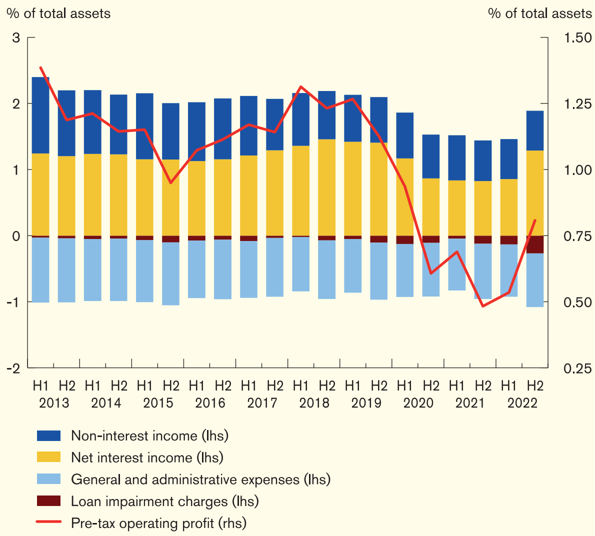
5.1 Profitability and capitalisation

Profitability

The aggregate pre-tax operating profit of retail banks[42] rose by 74.0% in the second half of 2022 compared with the same period in 2021, while the return on assets also rose to 0.80% from 0.48% (Chart 5.1). The improvement in profit was attributable to increases in net-interest income and income from foreign exchange and derivatives, which were partly offset by an increase in bad debt provisions and a decline in income from fees and commissions. Against the rising interest rate environment, the net interest margins (NIMs) of retail banks increased notably to 1.59% in the second half of 2022 from 0.98% a year ago (Chart 5.2).

For 2022 as a whole, the aggregate pre-tax operating profit increased by 19.0%, while the return on assets rose to 0.67% from 0.59% in 2021.

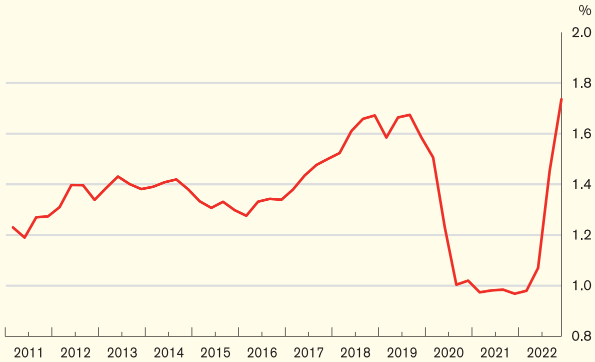
Chart 5.1
Profitability of retail banks



Note: Annualised semi-annual figures.
Source: HKMA.

[42] Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, unless otherwise stated.

Chart 5.2
Net interest margin of retail banks

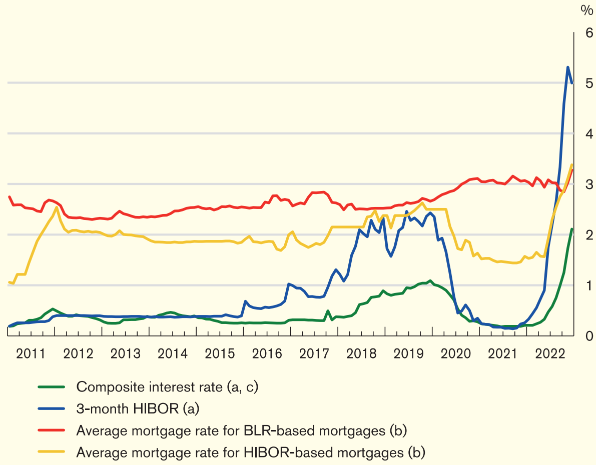


Note: Annualised quarterly figures.
Source: HKMA.

Largely following the rapid increase in US interest rates, the Hong Kong Interbank Offered Rates (HIBORs) rose markedly in 2022. In particular, the three-month HIBOR, after having increased by 149 basis points in the first six months of 2022, rose by another 324 basis points in the second half of the year to 4.99% at the end of December 2022 (the blue line in Chart 5.3).[43]

On the retail front, banks have generally lifted their Hong Kong dollar time-deposit rates to compete for long-term stable funding. In addition, banks raised their savings deposit rates several times in 2022, in line with the corresponding rise in their best lending rates (BLR). Reflecting both higher wholesale and retail funding costs, the composite interest rate (a measure of the average cost of Hong Kong dollar funds for retail banks) has increased by 164 basis points over the past six months to 2.11% at the end of 2022 (green line in Chart 5.3). Nevertheless, the rise in the composite interest rate remained relatively moderate compared to the US interest rate hikes during the same period.

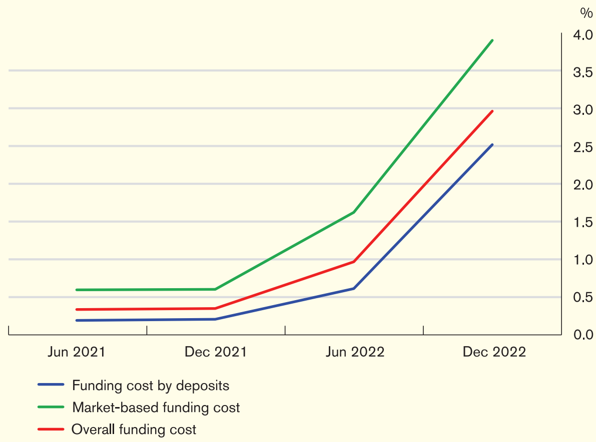
Chart 5.3
Interest rates



Notes:
(a) End-of-period figures.
(b) Period-average figures for newly approved loans.
(c) Since June 2019, the composite interest rate has been calculated based on the new local "interest rate risk in the banking book" (IRRBB) framework. As such, figures from June 2019 onwards are not strictly comparable with those of previous months.
Sources: HKMA and staff estimates.

More broadly, the overall Hong Kong dollar and US dollar funding cost for licensed banks in Hong Kong also exhibited a similar picture, as it increased by 199 basis points during the second half of 2022 (red line in Chart 5.4).

Chart 5.4
Hong Kong dollar and US dollar funding costs of licensed banks



Note: Since June 2019, licensed banks not exempted from the new local IRRBB framework report under the new framework, while exempted licensed banks continue to report under the existing interest rate risk exposure framework. The overall funding cost has been calculated as the weighted averages of the respective funding costs for these two groups of licensed banks. As such, figures from June 2019 onwards are not directly comparable with those of previous periods.

Source: HKMA.

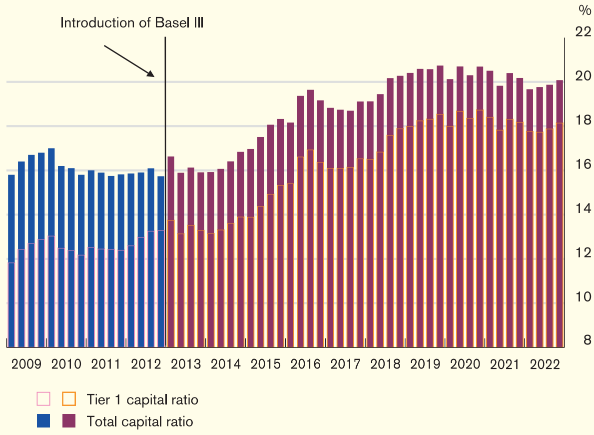
[43] However, HIBORs broadly softened in January 2023 after the year-end effect dissipated.

Looking ahead, while higher interest rates alongside the relaxation of COVID-19 restrictions in Mainland China and Hong Kong would benefit banks' earnings, the external environment may continue to cloud the profitability outlook. In particular, amid the monetary tightening in major advanced economies, the tighter global financing conditions and the associated negative impacts on global growth might worsen borrowers' debt repayment abilities. This could increase banks' loan loss provisions and thus weigh on profitability.

Capitalisation

Capitalisation of the Hong Kong banking sector continued to be strong and well above minimum international standards. The consolidated total capital ratio of locally incorporated authorized institutions (AIs) stood at a high level of 20.1% at the end of 2022 (Chart 5.5), well above the international minimum requirement of 8%. The Tier 1 capital and the Common Equity Tier 1 (CET1) capital ratio were 18.1% and 16.2%, respectively. In addition, the non-risk-based Leverage Ratio[44] (LR) of locally incorporated AIs recorded a healthy level of 7.9% at the end of December 2022, exceeding the statutory minimum of 3%.

Chart 5.5
Capitalisation of locally incorporated AIs



Notes:
1. Consolidated basis.
2. With effect from 1 January 2013, a revised capital adequacy framework under Basel III was introduced for locally incorporated AIs. The capital ratios from March 2013 onwards are therefore not directly comparable with those up to December 2012.

Source: HKMA.

5.2 *Liquidity and interest rate risks*

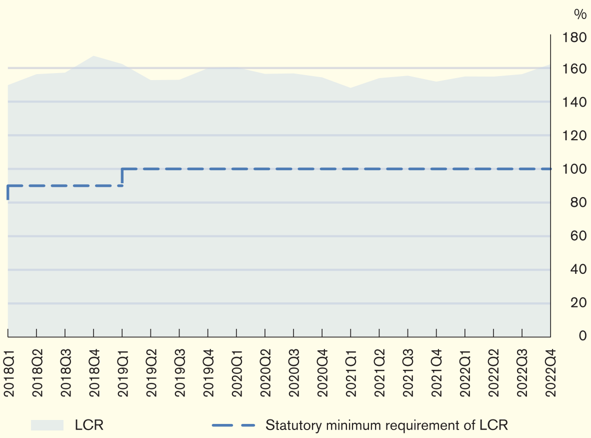
Liquidity and funding

The liquidity positions of the banking sector, as measured by the Basel III Liquidity Coverage Ratio (LCR)[45], remained sound during the review period. The average LCR of category 1 institutions rose to 162.3% in the fourth quarter of 2022 from 154.9% in the second quarter of 2022 (Chart 5.6), staying well above the statutory minimum requirement of 100%. The average Liquidity Maintenance Ratio (LMR) of category 2 institutions was 63.2% during the same period, also well above the statutory minimum requirement of 25%.

[44] The Basel III non-risk-based LR requirement acts as a "backstop" to restrict the build-up of excessive leverage in the banking sector. For details, see Banking (Capital) Rules (Cap. 155L).

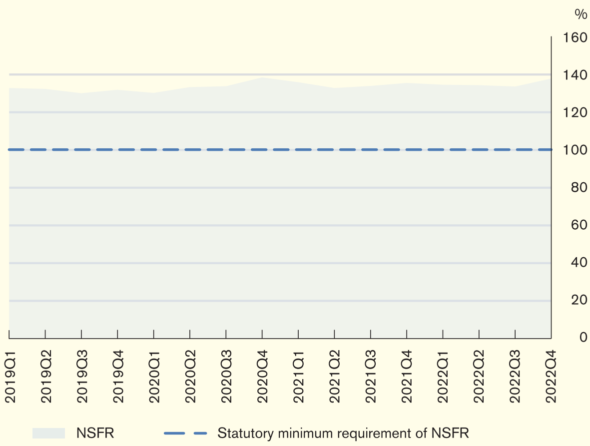
[45] The Basel III LCR requirement is designed to ensure that banks have sufficient high-quality liquid assets to survive a significant stress scenario lasting 30 calendar days. In Hong Kong, AIs designated as category 1 institutions adopt the LCR; while category 2 institutions adopt the LMR. For details, see the HKMA's Supervisory Policy Manual (SPM) LM-1, "*Regulatory Framework for Supervision of Liquidity Risk*".

Chart 5.6
Liquidity Coverage Ratio



Notes:
1. Consolidated basis.
2. Quarterly average figures.
Source: HKMA.

Chart 5.7
Net Stable Funding Ratio

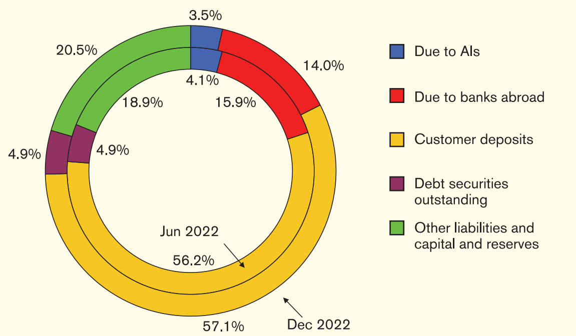


Note: Consolidated basis.
Source: HKMA.

The latest ratios of the Net Stable Funding Ratio (NSFR)[46] requirement also reflected a stable funding position of AIs. The average NSFR of category 1 institutions remained at a high level of 137.7% in the fourth quarter of 2022 (Chart 5.7), well above the statutory minimum requirement of 100%. The average Core Funding Ratio (CFR) of category 2A institutions also stayed at a high level of 155.7%, exceeding the statutory minimum requirement of 75%. The strong liquidity buffers and stable funding positions of AIs suggest that the Hong Kong banking sector is well positioned to withstand liquidity shocks.

Customer deposits continued to be the primary source of funding for AIs, underpinning a stable funding structure in the banking system. At the end of 2022, the share of customer deposits to all AIs' total liabilities increased marginally to 57.1% from 56.2% six months ago (Chart 5.8).

Chart 5.8
The liability structure of all AIs



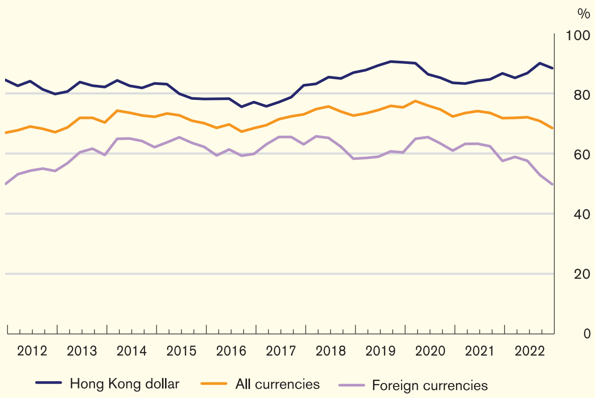
Notes:
1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities, including capital and reserves.
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.
Source: HKMA.

The average all-currency loan-to-deposit (LTD) ratio of all AIs declined slightly to 68.5% from 72.1% six months ago (Chart 5.9). The decrease was mainly driven by a drop in foreign currency LTD ratio, as foreign currency deposits increased while the foreign currency loan and advances declined notably during the review period. By

46 The Basel III NSFR requires banks to maintain a stable funding profile in relation to the composition of their assets and off-balance-sheet activities. In Hong Kong, category 1 institutions are required to comply with the NSFR; while category 2 institutions designated as category 2A institutions must comply with the requirements relating to the local CFR. For details, see Banking (Liquidity) Rules (Cap. 155Q).

contrast, the Hong Kong dollar LTD ratio increased to 88.4% at the end of 2022 from 86.8% six months ago.

Chart 5.9
Average loan-to-deposit ratios of all AIs



Note: End-of-quarter figures.
Source: HKMA.

Interest rate risk

The interest rate risk exposure of locally incorporated licensed banks remained at a relatively low level in the fourth quarter of 2022. Under a hypothetical shock of an across-the-board 200-basis-point increase in Hong Kong dollar and US dollar interest rates[47], the economic value of locally incorporated licensed banks' interest rate positions is estimated to decline by an amount equivalent to 2.30% of their total capital base at the end of December 2022.[48]

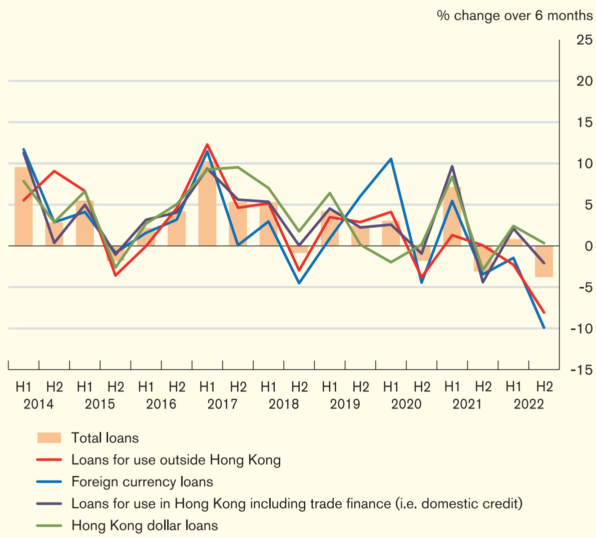
5.3 Credit risk

Overview

Partly reflecting subdued credit demand amid higher borrowing costs and soft domestic economic activities, total loans and advances decreased by 3.8% in the second half of 2022, after increasing by 0.8% in the first half (Chart 5.10).[49]

The decline in total loans and advances was driven by a contraction in both domestic loans (comprising loans for use in Hong Kong and trade financing) and loans for use outside Hong Kong. Domestic loans declined by 2.1% in the second half of 2022 after registering an increase of 2.1% in the first half, while loans for use outside Hong Kong decreased by 8.1% during the second half further to a decline of 2.3% in the first half.

Chart 5.10
Loan growth



Note: Since December 2018, figures for loans for use in or outside Hong Kong have been restated to reflect AIs' reclassification of working capital loans. The reported percentage changes over six months for 2019 and onwards are calculated based on the reclassified loan data, while the historical percentage changes until the second half of 2018 are calculated based on the data without such reclassification.
Source: HKMA.

Banks' assessment on credit demand outlook in the near term improved slightly. According to the results of the HKMA Opinion Survey on Credit Condition Outlook in December 2022, the share of surveyed AIs expecting loan demand to be higher in the following three months increased to 27% compared to the results conducted six months ago (Table 5.A).

47 The impact of the interest rate shock refers to its impact on the economic value of the banking and trading book, expressed as a percentage of the total capital bases of banks.

48 This estimation does not take into account the effect of any mitigating action by banks in response to the shock. The impact will be smaller if mitigating action is taken.

49 For 2022 as a whole, total loans and advances declined by 3.0%, after increasing by 3.8% in 2021.

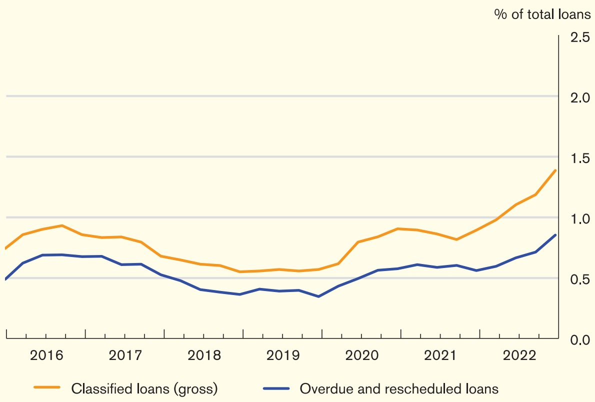
Table 5.A
Expectations of loan demand in the next three months

% of total respondents	Mar-22	Jun-22	Sep-22	Dec-22
Considerably higher	0	0	0	0
Somewhat higher	20	20	20	27
Same	60	70	70	60
Somewhat lower	20	10	10	10
Considerably lower	0	0	0	3
Total	100	100	100	100

Note: Figures may not add up to total due to rounding.
Source: HKMA.

Due to the challenging external and domestic economic environment, the asset quality of banks' loan portfolios deteriorated modestly. The gross classified loan ratio (CLR) of all AIs rose to 1.38% in the end of 2022 from 1.10% six months ago, while the ratio of overdue and rescheduled loans of all AIs also rose to 0.85% at the end of December 2022 from 0.66% at the end of June 2022 (Chart 5.11). Despite the deterioration, the asset quality of the Hong Kong banking sector remained at a healthy level.

Chart 5.11
Asset quality of all AIs



Note: Classified loans are those loans graded as "sub-standard", "doubtful" or "loss".
Source: HKMA.

Household exposure[50]

Household debt grew by 0.7% in both the first and second half of 2022, visibly slower than the 4.4% increase in the second half of 2021 (Table 5.B). A breakdown of the data shows that the growth of residential mortgage loan moderated further to 1.9% in the second half of 2022, given the lower number of residential property transactions. Personal loans declined further by 2.2%.

Table 5.B
Half-yearly growth of loans to households of all AIs

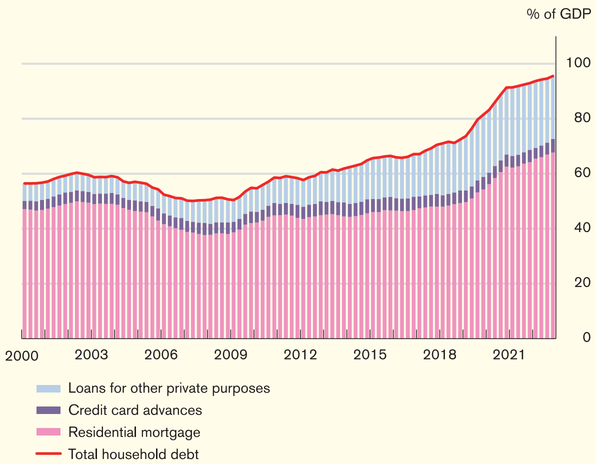
	2019		2020		2021		2022	
(%)	H1	H2	H1	H2	H1	H2	H1	H2
Residential mortgages	4.7	5.5	3.5	4.7	4.0	5.7	2.1	1.9
Personal loans	11.2	5.9	-2.4	2.2	5.3	1.6	-2.5	-2.2
of which:								
Credit card advances	-3.8	4.1	-9.0	0.0	-0.4	8.1	-5.3	14.4
Loans for other private purposes	14.9	6.2	-1.1	2.6	6.4	0.4	-2.0	-5.1
Total loans to households	6.8	5.6	1.5	3.9	4.4	4.4	0.7	0.7

Source: HKMA.

The household debt-to-GDP ratio rose to 95.5% in the second half of 2022 (Chart 5.12), from 94.2% in the first half of 2022. During this period, the growth in household debt contributed 0.6 percentage points of the 1.3-percentage-point increase in the household debt-to-GDP ratio. The decrease in Hong Kong's nominal gross domestic product (GDP) contributed 0.7 percentage points of the increase in the ratio.

[50] Loans to households constitute lending to professional and private individuals, excluding lending for other business purposes. Mortgages account for a major proportion of household loans, while the remainder comprises mainly loans to private banking and wealth management customers secured by financial assets, credit card advances, and unsecured personal loans. At the end of December 2022, loans to households accounted for 35.0% of domestic lending.

Chart 5.12
Household debt-to-GDP ratio and its components



Notes:
1. Only borrowings from AIs are covered.
2. GDP refers to the annualised GDP, which is the sum of the quarterly GDP in the trailing four quarters.
3. Since December 2018, the figure for household debt has been restated to reflect AIs' reclassification of working capital loans.

Source: HKMA.

It is noteworthy that the household debt-to-GDP ratio is a widely-used measure for gauging the financial soundness of households due to its simplicity. When interpreting this ratio, it is important to take into account that: (i) the denominator of the ratio uses nominal GDP as a proxy for the household income for ease of comparison across economies, and is thus not the actual income of the households with borrowings. Therefore, the household debt-to-GDP ratio does not reflect the actual debt servicing burden of households in the economy; and (ii) the numerator takes into account only the gross debts of households (instead of the net debts which take into account household assets).

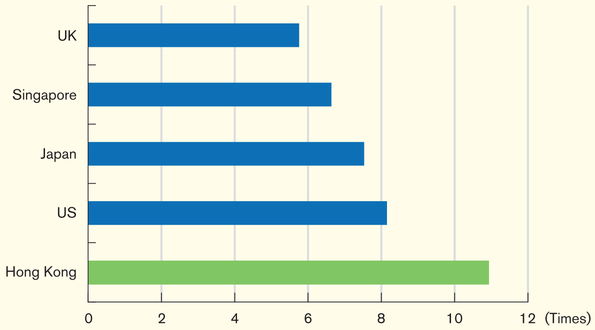
As such, a full and objective assessment of the risks associated with household debt requires the consideration of other factors, including the actual debt servicing ratio and the asset side of the household balance sheet. In fact, the average debt servicing ratio of new mortgages remained at a healthy level of 37% on average in 2022. Household net worth has also stayed at a high level. Specifically, both the net worth-to-liabilities ratio and the safe asset-to-liabilities ratio of Hong Kong's household sector remained high at 10.9 times and 2.91 times respectively in 2021 (Charts 5.13 and 5.14), which are much higher than those of most other developed economies. This suggests that Hong Kong's households, on aggregate, are financially sound and have a strong buffer to cushion potential financial and economic shocks.

The HKMA has been closely monitoring household indebtedness and regularly collects data from the banks. The majority of the household debts are residential mortgage loans, which are governed by the macroprudential policy framework, as well as collateralised loans to wealth management customers against financial assets. Coupled with the fact that household net worth has stayed at a high level, the HKMA considers that the household balance sheet remains healthy and the associated credit risk is manageable.

For residential mortgages, the average loan-to-value (LTV) ratio and average debt servicing ratio of newly approved mortgage loans have stayed at healthy levels following several rounds of countercyclical macro-prudential measures introduced by the HKMA since 2009. For personal loans to wealth management customers secured by financial assets, the HKMA requires banks to adopt prudent and effective credit risk management measures on this type of business. Such measures include imposing a cap on LTV ratios for financial assets pledged as collateral, issuing prompt margin calls, and adopting forced liquidation mechanisms.

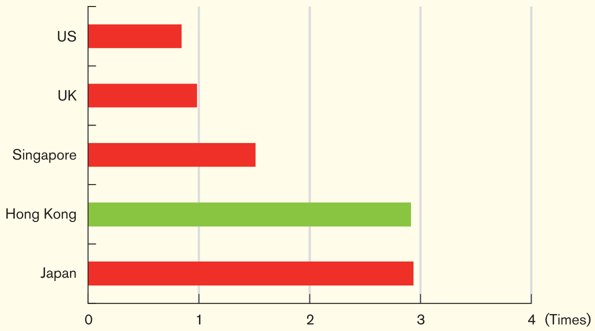
The HKMA also requires banks to adopt prudent underwriting standards for credit card advance and unsecured personal loan businesses. In reviewing credit applications, banks should understand borrowers' credit and financial conditions and carefully assess their repayment ability. As for post-lending, banks should implement effective monitoring that includes regular assessment of the asset quality of the loan portfolios.

Chart 5.13
Household net worth-to-liabilities ratio for selected economies



Note: Figure for Japan refers to that at end-2020, while figures for other economies (including Hong Kong) refer to those at end-2021.
Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

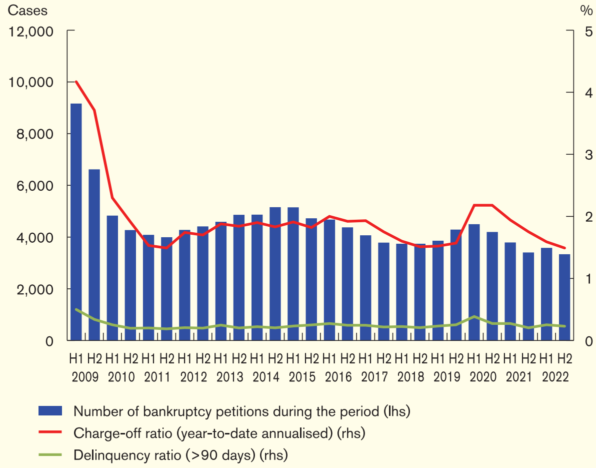
Chart 5.14
Safe assets-to-liabilities ratio for selected economies



Note: Safe assets comprise deposits, as well as currencies if data is available. In the case of Hong Kong, safe assets refer to deposits only. Figure for Japan refers to that at end-2020, while figures for other economies (including Hong Kong) refer to those at end-2021.
Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

For unsecured household exposure, the associated credit risk remained contained during the review period. The number of bankruptcy petitions decreased in the second half of 2022 compared with the preceding six months. The year-to-date annualised credit card charge-off ratio decreased from 1.59% in the second quarter to 1.49% in the fourth quarter of 2022, while the delinquency ratio dropped to 0.23% in December 2022 (Chart 5.15).

Chart 5.15
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions

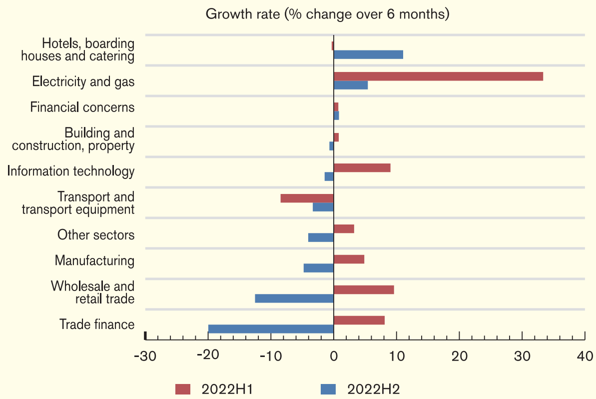


Sources: Official Receiver's Office and HKMA.

Corporate exposure[51]

Domestic corporate loans contracted in the second half of 2022 by 3.5%, after recording a solid growth of 2.9% during the first half. Except for lending to the hotels and catering sector, lending to most economic sectors recorded weak loan growth or decline in loan volume during the second half (Chart 5.16).

Chart 5.16
Growth in domestic corporate loans by selected sector



Source: HKMA.

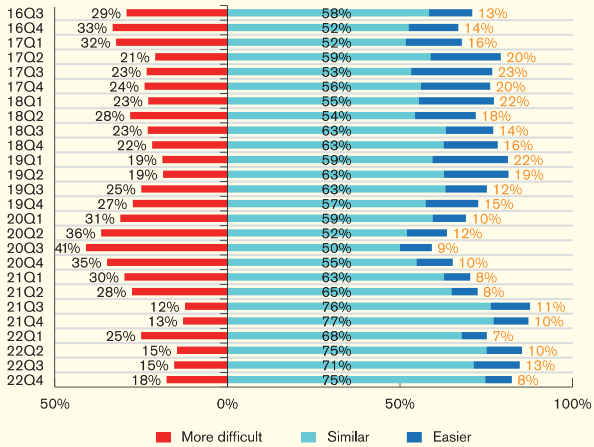
[51] Excluding interbank exposure. At the end of 2022, the share of corporate loans in domestic lending was 64.9%.

The demand-side survey on the credit conditions of small and medium-sized enterprises (SMEs) showed that SMEs' perception of banks' credit approval stance weakened in the fourth quarter of 2022, with 18% of the respondents perceiving credit approval as "more difficult" relative to six months ago, up from 15% registered in the previous quarter (Chart 5.17). That said, the perception of a more difficult credit approval stance may not necessarily reflect actual difficulties faced by SMEs in obtaining bank credit as the perception could be affected by a number of factors, such as media or news reports, business conditions, and opinions of relatives and friends.

Of the respondents with existing credit lines, 18% indicated a tighter stance by banks in the fourth quarter, up from 12% registered in the previous quarter (Chart 5.18). As a tighter stance on existing credit lines denotes a range of possible measures or arrangements (e.g. reducing unused and used credit lines, raising the interest rate, imposing additional collateral requirements, or shortening loan tenor), respondents' indication of banks' stance on existing credit lines may not directly reflect banks' supply of credit to SMEs.

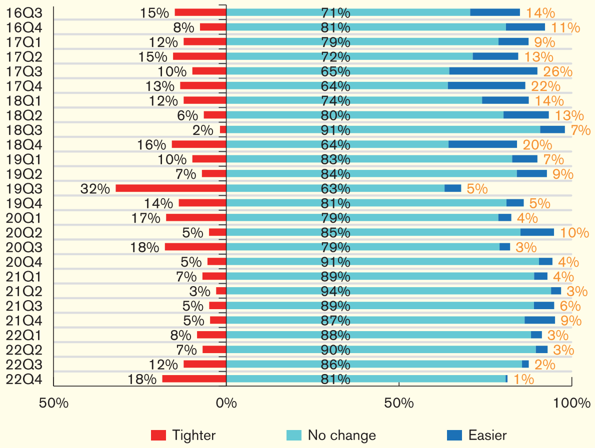
In light of the continued challenges facing SMEs, the HKMA announced in October 2022 an extension of the Pre-approved Principal Payment Holiday Scheme (the Scheme) to the end of July 2023. At the same time, the Scheme offered an additional option to corporates that are financially capable and willing to resume principal repayment gradually, to repay 50% of the original principal repayment amount over a period of two years on a voluntary basis. By the end of February 2023, over 111,000 credit relief cases had been granted to corporate customers under the Scheme and other initiatives implemented by banks during the pandemic, involving an aggregate amount of over HK$1.1 trillion. Having regard to the new arrangement by the HKMA and the banking sector to further extend the Scheme, HKMC Insurance Limited, the administrator of the SME Financing Guarantee Scheme (SFGS), has extended the application period for the principal moratorium arrangement under the SFGS to end-June 2023 as well as the maximum principal moratorium period of the SFGS to a total of 42 months. Two options for borrowers to resume partial principal repayment were provided, allowing borrowers to resume normal repayment gradually if they are willing and capable. As of 28 February 2023, over 60,000 applications involving about HK$121 billion in loans had been approved under the Special 100% Loan Guarantee. With the overarching objective of maintaining banking stability, the HKMA will from time to time review the case for further extension of the various relief measures.

Chart 5.17
SMEs' perception of banks' credit approval stance relative to six months ago



Note: Excluding respondents who answered "no idea / don't know".
Source: HKMA.

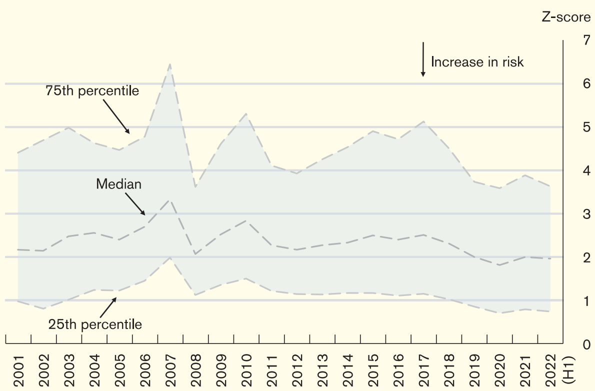
Chart 5.18
SMEs' reported change in banks' stance on existing credit lines



Note: The data covers only respondents with existing credit lines.
Source: HKMA.

Turning to the financial health of listed corporates, the Altman's Z-score (a default risk measure for non-financial corporates based on accounting data) for Hong Kong-listed non-financial corporates have remained largely stable up to the first half of 2022 (Chart 5.19). The relatively stable default risk partly reflected the continued improvement in listed corporates' financial fundamentals since 2020.

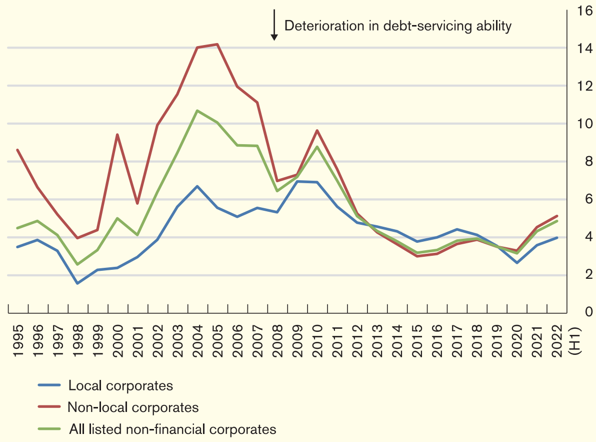
Chart 5.19
Altman's Z-score of listed non-financial corporates in Hong Kong



Notes:
1. All non-financial corporates listed on the Hong Kong Stock Exchange are selected.
2. Figures are calculated based on information up to end-February 2023.
Source: HKMA staff calculations based on estimates compiled by Bloomberg.

Specifically, listed non-financial corporates' debt servicing ability recorded a further improvement during the first half of 2022. In particular, the weighted average interest coverage ratios (ICRs) for both local and non-local corporates rose further in the first half of 2022 (the blue and red lines in Chart 5.20).

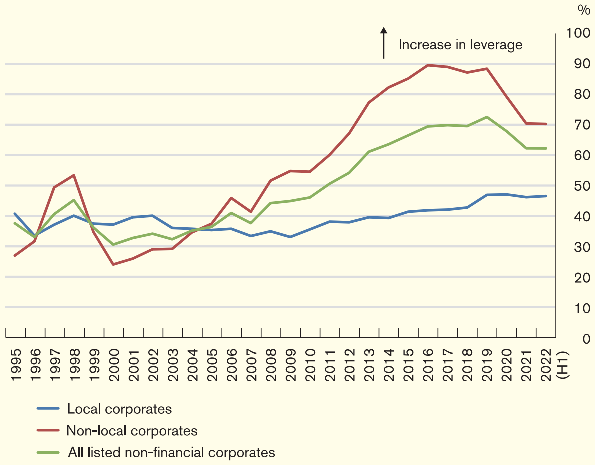
Chart 5.20
Interest coverage ratio of listed non-financial corporates in Hong Kong



Notes:
1. Weighted average figures.
2. The ICR is calculated by dividing the earnings before interest and tax (EBIT) by total interest expenses. A lower value indicates deterioration of debt servicing ability.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong, respectively.
4. Figures are calculated based on information up to end-February 2023.
Source: HKMA staff estimates based on data from Bloomberg.

Meanwhile, the weighted average debt-to-equity ratio, a common measure of corporate leverage, also remained stable in the first half of 2022 for both local and non-local listed non-financial corporates in Hong Kong (Chart 5.21).

Chart 5.21[52]
Leverage ratio of listed non-financial corporates in Hong Kong



Notes:
1. Weighted average figures.
2. The leverage ratio is defined as the ratio of debt to equity. A higher value indicates higher leverage.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong, respectively.
4. Figures are calculated based on information up to end-February 2023.

Source: HKMA staff estimates based on data from Bloomberg.

Going forward, the relaxation of COVID-19 restrictions in Mainland China and Hong Kong may help improve corporates' fundamentals. However, the uncertainty related to the future pace of monetary tightening by central banks in major advanced economies will pose headwinds to the global growth outlook. Should the interest rates stay higher and longer than expected, corporates' debt repayment abilities, and hence default risk, may be under pressure. Banks should therefore stay alert to the credit risk of their corporate exposures.

Mainland-related lending and non-bank exposures

The banking sector's total Mainland-related lending decreased by 5.9% to HK$4,522 billion (14.9% of total assets) at the end of December 2022, from HK$4,805 billion (15.7% of total assets) at the end of June 2022 (Table 5.C). Other non-bank exposures decreased by 4.9% to HK$1,841 billion (Table 5.D).

Table 5.C
Mainland-related lending

HK$ bn	Mar 2022	Jun 2022	Sep 2022	Dec 2022
Mainland-related loans	4,881	4,805	4,714	4,522
Mainland-related loans excluding trade finance	4,495	4,429	4,388	4,254
Trade finance	385	377	326	268
By type of AIs:				
Overseas incorporated AIs	1,771	1,719	1,702	1,604
Locally incorporated AIs*	2,208	2,231	2,207	2,104
Mainland banking subsidiaries of locally incorporated AIs	901	855	805	814
By type of borrowers:				
Mainland state-owned entities	1,961	1,955	1,908	1,824
Mainland private entities	1,500	1,475	1,446	1,405
Non-Mainland entities	1,419	1,375	1,360	1,293

Notes:
1. * Including loans booked in Mainland branches of locally incorporated AIs.
2. Figures may not add up to the total due to rounding.

Source: HKMA.

Table 5.D
Other non-bank exposures

HK$ bn	Mar 2022	Jun 2022	Sep 2022	Dec 2022
Negotiable debt instruments and other on-balance sheet exposures	1,481	1,424	1,344	1,337
Off-balance sheet exposures	514	512	521	504
Total	**1,995**	**1,936**	**1,865**	**1,841**

Note: Figures may not add up to the total due to rounding.
Source: HKMA.

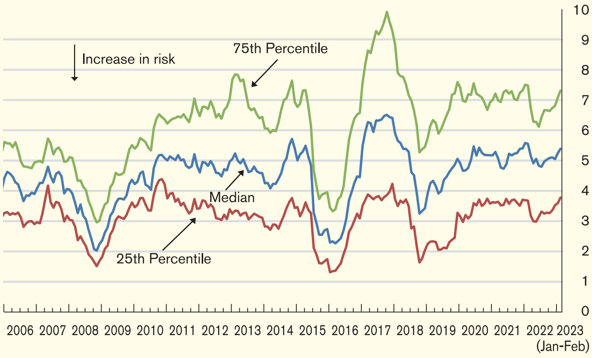
The gross CLR of Mainland-related lending of all AIs[53] increased to 2.21% at the end of 2022 from 1.50% at end-June 2022.

[52] Starting from this issue, given the availability of several years' data for conducting trend analysis, and also in accordance with the Hong Kong Financial Reporting Standard 16 effective in 2019, we have included again firms' operating lease liabilities as part of firms' debt when calculating the weighted average debt-to-equity ratio. As such, data starting from 2019 and onward will be somewhat different from those reported in previous issues.

[53] Figures cover AIs' Hong Kong offices and Mainland branches and subsidiaries.

However, the distance-to-default (DTD) index[54] (a forward-looking market-based indicator) suggested a slight improvement in the default risk of the Mainland corporate sector since late-2022 (Chart 5.22), reflecting the improved market sentiment as a result of the relaxation of COVID-19 restrictions in Mainland China.

Chart 5.22
Distance-to-default index for the Mainland corporate sector



Note: The DTD index is calculated based on the non-financial constituent companies (i.e. excluding investment companies and those engaged in banking, insurance and finance) of the Shanghai Stock Exchange 180 A-share index.
Source: HKMA staff estimates based on data from Bloomberg.

In spite of the more positive economic outlook for Mainland China due to the relaxation of COVID-19 restrictions, the pace of the economic recovery will still be subject to uncertainty, particularly with future COVID-19 development, and thus the pace of resumption of economic activities. Also, in view of the risk associated with the property market downturn, banks should stay attentive to the credit risk management of their Mainland-related exposures.

Macro stress testing of credit risk[55]

Results of the latest macro stress testing on retail banks' credit exposure suggest the Hong Kong banking sector remains resilient and should be able to withstand severe macroeconomic shocks similar to those experienced during the Asian financial crisis. Chart 5.23 presents a simulated future credit loss rate of retail banks in the fourth quarter of 2024 under four specific macroeconomic shocks[56] using information up to the fourth quarter of 2022.

In stressed scenarios, the expected average credit losses two years after different macroeconomic shocks are estimated to be moderate, ranging from 1.11% (Interest rate shock) to 1.98% (Hong Kong GDP shock).

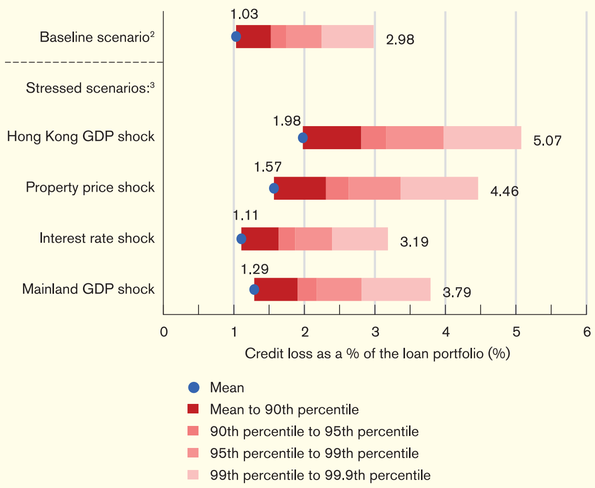
Taking into account tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 3.19% (Interest rate shock) to 5.07% (Hong Kong GDP shock). The probability of such extreme scenarios actually occurring, however, is very small, given that the Hong Kong economy has already registered a visible economic downturn during 2022, and the chance of a further sharp fall in GDP from such a low base is very small.

54 The DTD is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449–470, in which equity prices, equity volatility, and companies' financial liabilities are the determinants of default risk. In essence, it measures the difference between the asset value of a firm and a default threshold in terms of the firm's asset volatility.

55 Macro stress testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. The credit loss estimates presented in this report are obtained based on a revised framework from J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3–23. All estimates in the current report are not strictly comparable to estimates from previous reports.

56 These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

Chart 5.23
The mean and value-at-risk statistics of simulated credit loss distributions[1]



Notes:
1. The assessments assume the economic conditions in Q4 2022 as the current environment. The Monte Carlo simulation method is adopted to generate the credit loss distribution for each scenario.
2. Baseline scenario: no shock throughout the two-year period.
3. Stressed scenarios:
   Hong Kong GDP shock: reductions in Hong Kong's real GDP by 2.7%, 2.4%, 1.7% and 1.6% respectively in each of the four consecutive quarters starting from Q1 2023 to Q4 2023.
   Property price shock: Reductions in Hong Kong's real property prices by an average of 12% in each of the four consecutive quarters starting from Q1 2023 to Q4 2023.
   Interest rate shock: A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. Q1 2023), followed by no changes in the second and third quarters, and another rise of 300 basis points in the fourth quarter (i.e. Q4 2023).
   Mainland GDP shock: An average year-on-year real GDP growth rate of 2% for the four consecutive quarters starting from Q1 2023.

Source: HKMA staff estimates.

5.4 Systemic risk

Although the relaxation of COVID restrictions in both Mainland China and Hong Kong should brighten the outlook for the Hong Kong economy, several downside risk factors could still pose challenges to the credit risk management for banks in Hong Kong.

First, the pace of the US interest rate rise continues to be a key factor affecting the Hong Kong banking sector. If the US inflation rate pressure persists, the "high-for-longer" interest rate environment may transmit to the region, including Hong Kong, which may exert pressure on borrowers' repayment abilities.

Second, the risk of a sharp global economic slowdown stemming from the monetary tightening by central banks in major advanced economies is another key factor to watch. A sharp reduction in global demand could hurt corporate earnings, particularly for those relying on export business. A deterioration in earnings together with higher debt servicing costs would put their debt repayment abilities to the test and present challenges to banks' credit risk management for their corporate exposures.

Geopolitical risks, such as the ongoing war in Ukraine, will continue to be one important risk factor. Any escalation in geopolitical conflicts could further increase the downside risks to the global economy.

The recent turmoil in the global banking system warrants close monitoring, although it has so far not posed any significant impact on the Hong Kong banking sector given the limited direct exposures of the local banking sector to the affected banks. In addition, the Hong Kong banking sector has remained resilient with strong capital and liquidity positions. However, given that the development remains highly uncertain, the HKMA will continue to monitor the situation closely.

Overall, the robust capital and liquidity positions of the Hong Kong banking sector should provide strong buffers to cope with the impacts of these downside risks.

The countercyclical capital buffer for Hong Kong

The countercyclical capital buffer (CCyB) is part of the internationally agreed Basel III standards and is designed to enhance the resilience of the banking sector against system-wide risks. This buffer can be reduced in times of a downturn, allowing banks to continue providing credit to support the real economy. The latest applicable jurisdictional CCyB for Hong Kong, announced on 8 February 2023, is 1.0%[57].

In setting the CCyB, the Monetary Authority considered a series of indicators (Table 5.E), including an "indicative buffer guide" (which is a metric providing a guide for the CCyB based on the gap between the ratio of credit-to-GDP and its long term trend, and between the ratio of residential property prices to rentals and its long term trend)[58]. The setting of the CCyB for Hong Kong is, however, not a mechanical exercise and the Monetary Authority will always consider a broad range of reference indicators ("Comprehensive Reference Indicators") and all relevant information available in addition to the indicative buffer guide.[59]

In the latest assessment based on the third quarter data of 2022, the indicative buffer guide signals a CCyB of 0%. The projection, based on all available data at the decision date, suggests the indicative buffer guide is likely to signal a CCyB of 0% when all relevant data for the fourth quarter of 2022 become available.

The information drawn from the series of Comprehensive Reference Indicators, along with all relevant information available at the time of the decision in January 2023, suggests that the latest economic indicators point to continued soft economic activities in Hong Kong in the fourth quarter of 2022. Uncertainties about the global and domestic economic environment remain high, but there have been initial signs of stabilisation in domestic economic activities. Therefore, the Monetary Authority considers that it is appropriate to keep the CCyB unchanged at 1.0% and continue to monitor the situation closely.

Table 5.E
Information related to the Hong Kong jurisdictional CCyB

	2-Aug-22	4-Nov-22	8-Feb-23
Announced CCyB rate	1.0%	1.0%	1.0%
Date effective	02/08/2022	04/11/2022	08/02/2023
Indicative buffer guide	0.0%	0.0%	0.0%
Basel Common Reference Guide	2.5%	2.5%	0.8%
Property Buffer Guide	0.0%	0.0%	0.0%
Composite CCyB Guide	0.0%	0.0%	0.0%
Indicative CCyB Ceiling	None	None	None
Primary gap indicators			
Credit/GDP gap	19.8%	11.4%	4.6%
Property price/rent gap	1.7%	1.2%	-5.5%
Primary stress indicators			
3-month HIBOR spread (percentage points)	0.59%	0.34%	0.43%
Quarterly change in classified loan ratio (percentage points)	0.10%	0.11%	0.12%

Note: The values of all CCyB guides, the Indicative CCyB Ceiling and their respective input variables are based on public data available prior to the corresponding review/announcement date, and may not be the most recent available as of each quarter end (refer to SPM CA-B-1 for explanations of the variables).

Source: HKMA.

Key performance indicators of the banking sector are provided in Table 5.F.

57 For details, see the Announcement of the CCyB to AIs on 8 February 2023 (https://www.hkma.gov.hk/eng/key-functions/banking/banking-legislation-policies-and-standards-implementation/countercyclical-capital-buffer-ccyb/).

58 The credit-to-GDP gap is the gap between the ratio of credit to GDP and its long-term trend, while the property price-to-rent gap is the gap between the ratio of residential property prices to rentals and its long-term trend.

59 These include measures of bank, corporate and household leverage; debt servicing capacity; profitability and funding conditions within the banking sector and macroeconomic imbalances.

Table 5.F
Key performance indicators of the banking sector[1] (%)

	Dec 2021	Sep 2022	Dec 2022
Interest rates			
1-month HIBOR fixing[2] (quarterly average)	0.11	1.63	3.67
3-month HIBOR fixing (quarterly average)	0.20	2.42	4.75
BLR[3] and 1-month HIBOR fixing spread (quarterly average)	4.89	3.38	1.65
BLR and 3-month HIBOR fixing spread (quarterly average)	4.80	2.59	0.58
Composite interest rate[4]	0.21	0.99	2.11
		All AIs	
Balance sheet developments[5]			
Total deposits	+1.2	+0.3	+1.0
Hong Kong dollar	-0.9	-2.7	+1.2
Foreign currency	+3.3	+3.3	+0.9
Total loans	-1.2	-1.5	-2.4
Domestic lending[6]	-0.8	-0.8	-1.3
Loans for use outside Hong Kong[7]	-2.1	-3.0	-5.2
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	+1.1	-3.4	+9.2
Negotiable debt instruments held (excluding NCDs)	+3.7	-2.8	+3.7
Asset quality			
As a percentage of total loans[8]			
Pass loans	97.56	97.08	96.59
Special mention loans	1.55	1.73	2.03
Classified loans[9] (gross)	0.89	1.19	1.38
Classified loans (net)[10]	0.50	0.68	0.79
Overdue > 3 months and rescheduled loans	0.56	0.71	0.85
Classified loan ratio (gross) of Mainland related lending[11]	0.89	1.80	2.21
Liquidity ratios (consolidated)			
Liquidity Coverage Ratio — applicable to category 1 institutions (quarterly average)	151.9	156.3	162.3
Liquidity Maintenance Ratio — applicable to category 2 institutions (quarterly average)	59.0	60.5	63.2
Net Stable Funding Ratio — applicable to category 1 institutions	135.3	133.4	137.7
Core Funding Ratio — applicable to category 2A institutions	150.3	150.3	155.7
		Retail banks	
Profitability			
Loan impairment charges as a percentage of average total assets (year-to-date annualised)	0.08	0.16	0.20
Net interest margin (year-to-date annualised)	0.98	1.17	1.31
Cost-to-income ratio (year-to-date)	54.7	50.9	48.0
		Surveyed institutions	
Asset quality			
Delinquency ratio of residential mortgage loans	0.04	0.04	0.06
Credit card lending			
Delinquency ratio	0.20	0.24	0.23
Charge-off ratio — quarterly annualised	1.53	1.68	1.50
— year-to-date annualised	1.75	1.59	1.49
		All locally incorporated AIs	
Capital adequacy (consolidated)			
Common Equity Tier 1 capital ratio	16.2	15.9	16.2
Tier 1 capital ratio	18.2	17.9	18.1
Total capital ratio	20.2	19.9	20.1
Leverage ratio	7.9	7.8	7.9

Notes:
1. Figures are related to Hong Kong offices only except where otherwise stated.
2. The Hong Kong Interbank Offered Rates are released by the Hong Kong Association of Banks.
3. With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
4. The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest-rate-sensitive liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and all other liabilities that do not involve any formal payment of interest but the values of which are sensitive to interest rate movements (such as Hong Kong dollar non-interest bearing demand deposits) on the books of banks. Further details can be found on the HKMA website.
5. Quarterly change.
6. Loans for use in Hong Kong plus trade finance.
7. Including "others" (i.e. unallocated).
8. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' overseas branches and major overseas subsidiaries.
9. Classified loans are those loans graded as "substandard", "doubtful" or "loss".
10. Net of specific provisions/individual impairment allowances.
11. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' Mainland branches and subsidiaries.

Glossary of terms

Aggregate Balance

The sum of balances in the clearing accounts and reserve accounts kept with the central bank. In Hong Kong, this refers to the sum of the balances in the clearing accounts kept with the HKMA. The Aggregate Balance is a part of the Monetary Base.

Authorized Institution (AI)

An institution authorized under the Banking Ordinance to carry on the business of taking deposits. Hong Kong maintains a Three-tier Banking System, which comprises licensed banks, restricted licence banks and deposit-taking companies.

Best Lending Rate

A benchmark interest rate that banks use to price loans. In Hong Kong, the Best Lending Rate is used as a base for quoting interest rates on mortgage loans.

Certificates of Indebtedness (CIs)

Certificates issued by the Financial Secretary under the Exchange Fund Ordinance, to be held by note-issuing banks as cover for the banknotes they issue.

Composite Consumer Price Index (CCPI)

The main consumer price index (CPI) for Hong Kong. The Census and Statistics Department compiles three separate CPI series relating to households in different expenditure ranges. The CPI(A) relates to about 50% of households in the relatively low expenditure range; the CPI(B) relates to the next 30% of households in the medium expenditure range; and the CPI(C) relates to the next 10% of households in the relatively high expenditure range. The Composite CPI is compiled based on the aggregate expenditure pattern of all of the above households taken together.

Composite Interest Rate

The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest-rate-sensitive liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and all other liabilities that do not involve any formal payment of interest but the values of which are sensitive to interest rate movements (such as Hong Kong dollar non-interest bearing demand deposits) on the books of banks. Data from retail banks, which account for the majority of the Hong Kong dollar deposits in the banking sector, are used in the calculation. It should be noted that the composite interest rate represents only average interest expenses. There are various other costs involved in the making of a loan, such as operating costs (e.g. staff and rental expenses), credit cost and hedging cost, which are not covered by the composite interest rate.

Convertibility Undertaking (CU)

An undertaking by a central bank or Currency Board to convert domestic currency into foreign currency and vice versa at a fixed exchange rate. In Hong Kong, the HKMA operates Convertibility Undertakings on both the strong side and the weak side of the Linked Rate of 7.80. Under the strong-side Convertibility

Undertaking, the HKMA undertakes to buy US dollars from licensed banks at 7.75. Under the weak-side Convertibility Undertaking, the HKMA undertakes to sell US dollars at 7.85. Within the Convertibility Zone between 7.75 and 7.85, the HKMA may choose to conduct market operations consistent with Currency Board principles with the aim of promoting the smooth functioning of the money and foreign exchange markets.

Convertibility Zone

The Hong Kong dollar-US dollar exchange rate band, defined by the levels of the strong- and weak-side Convertibility Undertakings, within which the HKMA may choose to conduct market operations consistent with Currency Board principles.

Exchange Fund Bills and Notes (EFBNs)

Debt instruments issued by the HKMA for the account of the Exchange Fund. These instruments are fully backed by the foreign reserves. The HKMA has undertaken that new Exchange Fund paper will only be issued when there is an inflow of funds, thus enabling the additional paper to be fully backed by the foreign reserves. Since 1 April 1999, interest payments on Exchange Fund paper have been allowed to expand the Monetary Base. Additional Exchange Fund paper is issued to absorb such interest payments. This is consistent with the Currency Board discipline since interest payments on Exchange Fund paper are backed by interest income on the US dollar assets backing the Monetary Base.

Monetary Base

A part of the monetary liabilities of a central bank. The Monetary Base is defined, at the minimum, as the sum of the currency in circulation (banknotes and coins) and the balance of the banking system held with the central bank (the reserve balance or the clearing balance). In Hong Kong, the Monetary Base comprises Certificates of Indebtedness (for backing the banknotes issued by the note-issuing banks), government-issued currency in circulation, the sum of the balances of the clearing accounts kept with the HKMA (the Aggregate Balance), and Exchange Fund Bills and Notes.

Money supply

The total stock of money available in the economy. Hong Kong has three measures of money supply: Money Supply definition 1 (M1) is defined as the sum of legal tender notes and coins held by the public plus customers' demand deposits placed with licensed banks. Money Supply definition 2 (M2) is defined as M1 plus customers' savings and time deposits with licensed banks plus negotiable certificates of deposit (NCDs) issued by licensed banks held outside the banking sector. Money Supply definition 3 (M3) is defined as M2 plus customers' deposits with restricted licence banks and deposit-taking companies plus NCDs issued by these institutions held outside the banking sector.

Nominal and Real Effective Exchange Rate (NEER and REER)

An indicator of the overall exchange rate value of the Hong Kong dollar against a basket of currencies of Hong Kong's principal trading partners. The nominal effective exchange rate (NEER) is a weighted average of the exchange rates between Hong Kong and its principal trading partners. The real effective exchange rate (REER) is obtained by adjusting the NEER for relative movements in the seasonally adjusted consumer price indices of those selected trading partners.

Abbreviations

1m moving average	One-month moving average
3m moving average	Three-month moving average
3m-on-3m	Three-month-on-three-month
AB	Aggregate Balance
AEs	Advanced economies
AIs	Authorized institutions
APAC	Asia Pacific
ASEAN	Association of Southeast Asian Nations
AU	Australia
ASX	Australian Securities Exchange
BAU	Business-as-usual
BIS	Bank for International Settlements
bn	Billion
BLR	Best lending rate
bps	basis points
CASG	Green and Sustainable Finance Cross-Agency Steering Group
CAR	Capital Adequacy Ratio
CBIRC	China Banking and Insurance Regulatory Commission
CPI	Consumer Price Index
CCPI	Composite Consumer Price Index
CCyB	Countercyclical capital buffer
CDs	Certificates of deposits
CET1	Common equity tier-one
CFR	Core Funding Ratio
CIs	Certificates of Indebtedness
CLR	Classified Loan Ratio
CMU	Central Moneymarkets Unit
CN	Mainland China
CNH	Offshore renminbi in Hong Kong
CNY	Onshore renminbi

COVID	Coronavirus Disease
CRST	Climate Risk Stress Test
C&SD	Census and Statistics Department
CSI	China Securities Index
CU	Convertibility Undertaking
DI	Direct investment
DID	Difference-in-differences
DSR	Debt-servicing ratio
DTD	Distance-to-default
EA	Euro area
EBIT	Earnings before interest and tax
EBITDA	Earnings before interest, taxes, depreciation and amortization
ECB	European Central Bank
EFBNs	Exchange Fund Bills and Notes
EM	Emerging-market
EMEAP	Executive's Meeting of East Asia-Pacific Central Banks
EMEs	Emerging Market Economies
EPS	Earnings per share
ESG	Environmental, Social and Governance
ETFs	Exchange traded funds
EU	European Union
EUR	Euro
F&B	Food and Beverage
FCS	Foreign currencies
Fed	Federal Reserve
FI	Financial Institution
FOMC	Federal Open Market Committee
FX	Foreign exchange
GBP	British Pound Sterling
GDP	Gross Domestic Product
GHG	Greenhouse gas
GICS	Global Industry Classification Standard
HIBOR	Hong Kong Interbank Offered Rate
HK	Hong Kong
HKD	Hong Kong dollar

HKEX	The Hong Kong Exchanges and Clearing Limited
HKFRS	Hong Kong Financial Reporting Standard
HKMA	Hong Kong Monetary Authority
HKPC	Hong Kong Productivity Council
HK$M3	Hong Kong dollar broad money supply
HSCEI	Hang Seng China Enterprises Index
HSI	Hang Seng Index
ICR	Interest Coverage Ratio
ICSD	International Central Securities Depository
ID	Indonesia
IDX	Indonesia Stock Exchange
IFC	International Finance Corporation
IIF	Institute of International Finance
IMF	International Monetary Fund
IPO	Initial Public Offering
IRRBB	Interest rate risk in the banking book
IT	Information technology
JP	Japan
JPY	Japanese Yen
KOSPI	Korea Composite Stock Price Index
KR	South Korea
KLCI	Kuala Lumpur Composite Index
LCR	Liquidity Coverage Ratio
LIBOR	London Interbank Offered Rate
LERS	Linked Exchange Rate System
lhs	Left-hand side
LMR	Liquidity Maintenance Ratio
LPR	Loan Prime Rate
LR	Leverage Ratio
LTD	Loan-to-deposit
LTV	Loan-to-value
MLF	Medium-term Lending Facility
mn	Million
MDBs	Multilateral Development Banks
MIP	Mortgage Insurance Programme
MRF	Mutual Recognition of Funds

MY	Malaysia
MSCI	Morgan Stanley Capital International
NASDAQ	National Association of Securities Dealers Automated Quotations
NBS	National Bureau of Statistics of China
NCD	Negotiable certificate of deposit
NEER	Nominal effective exchange rate
NFCs	Non-financial corporates
NIM	Net interest margin
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NPL	Non-performing loan
NSFR	Net Stable Funding Ratio
NZX	New Zealand's Exchange
OECD	Organisation for Economic Corporation and Development
PH	The Philippines
OIS	Overnight indexed swap
OTC	Over-the-counter
p.a.	Per annum
P2P	Peer-to-peer
PBoC	People's Bank of China
PD	Probability of default
PMI	Purchasing Managers' Index
POEs	Private-owned enterprises
PSEi	Philippine Stock Exchange Index
qoq	Quarter-on-quarter
qoqa	Quarter-on-quarter annualised
R&VD	Rating and Valuation Department
REER	Real effective exchange rate
Repo	Repurchase operation
rhs	Right-hand side
RMB	Renminbi
RML	Residential mortgage loan
ROA	Return on assets
ROE	Return on equity

RRR	Required reserve ratio
RTGS	Real Time Gross Settlement
RWA	Risk-weighted assets
SDR	Special Drawing Rights
SET	Stock Exchange of Thailand
SFGS	SME Financing Guarantee Scheme
SG	Singapore
SHIBOR	Shanghai Interbank Offered Rate
SKEW	Chicago Board Options Exchange Skew Index
SMEs	Small and medium-sized enterprises
SOEs	State-owned enterprises
SPM	Supervisory Policy Manual
STCs	Specialist Technology Companies
STI	Straits Times Index
S&P 500	Standard & Poor's 500 Index
TH	Thailand
th	Thousands
tn	trillion
TNA	Total net assets
TWI	Trade Weighted Index
UK	United Kingdom
UN	United Nations
US	United States
USD	US dollar
VAR	Vector Autoregression
VHSI	HSI Volatility Index
VIX	Chicago Board Options Exchange Market Volatility Index
wk	Week
WMP	Wealth management product
yoy	Year-on-year

Full text of this Report is available on the HKMA website at **www.hkma.gov.hk.**

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